

# 2017-2018 Graduate Calendar

The information published in this Graduate Calendar outlines the rules, regulations, curricula, programs and fees for the 2017-2018 academic years, including the Summer Semester 2017, Fall Semester 2017 and the Winter Semester 2018.

For your convenience the Graduate Calendar is available in PDF format.

If you wish to link to the Graduate Calendar please refer to the Linking Guidelines.

The University is a full member of:

- The Association of Universities and Colleges of Canada

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## Disclaimer

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The Office of Graduate Studies has attempted to ensure the accuracy of this on-line Graduate Calendar. However, the publication of information in this document does not bind the university to the provision of courses, programs, schedules of studies, fees, or facilities as listed herein.

## Limitations

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The University of Guelph reserves the right to change without notice any information contained in this calendar, including any rule or regulation pertaining to the standards for admission to, the requirements for the continuation of study in, and the requirements for the granting of degrees or diplomas in any or all of its programs.

The university will not be liable for any interruption in, or cancellation of, any academic activities as set forth in this calendar and related information where such interruption is caused by fire, strike, lock-out, inability to procure materials or trades, restrictive laws or governmental regulations, actions taken by the faculty, staff or students of the university or by others, civil unrest or disobedience, Public Health Emergencies, or any other cause of any kind beyond the reasonable control of the university.

The University of Guelph reaffirms section 1 of the Ontario Human Rights Code, 1981, which prohibits discrimination on the grounds of race, ancestry, place of origin, colour, ethnic origin, citizenship, creed, sex, sexual orientation, handicap, age, marital status or family status.

The university encourages applications from women, aboriginal peoples, visible minorities, persons with disabilities, and members of other under-represented groups.

# Introduction

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## Collection, Use and Disclosure of Personal Information

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Personal information is collected under the authority of the University of Guelph Act (1964), and in accordance with Ontario's Freedom of Information and Protection of Privacy Act (FIPPA) [http://www.e-laws.gov.on.ca/DBLaws/Statutes/English/90f31\\_e.htm](http://www.e-laws.gov.on.ca/DBLaws/Statutes/English/90f31_e.htm). This information is used by University officials in order to carry out their authorized academic and administrative responsibilities and also to establish a relationship for alumni and development purposes. Certain personal information is disclosed to external agencies, including the Ontario Universities Application Centre, the Ministry of Training, Colleges and Universities, and Statistics Canada, for statistical and planning purposes, and is disclosed to other individuals or organizations in accordance with the Office of Registrarial Services Departmental Policy on the Release of Student Information. For details on the use and disclosure of this information call the Office of Registrarial Services at the University at (519) 824-4120 or see <https://www.uoguelph.ca/registrar/>

## Statistics Canada - Notification of Disclosure

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For further information, please see Statistics Canada's web site at <http://www.statcan.gc.ca> and Section XIV Statistics Canada.

## Address for University Communication

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Depending on the nature and timing of the communication, the University may use one of these addresses to communicate with students. Students are, therefore, responsible for checking all of the following on a regular basis:

### Email Address

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The University issued email address is considered an official means of communication with the student and will be used for correspondence from the University. Students are responsible for monitoring their University-issued email account regularly.

### Home Address

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Students are responsible for maintaining a current mailing address with the University. Address changes can be made, in writing, through the Office of Graduate Studies.

## Name Changes

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The University of Guelph is committed to the integrity of its student records, therefore, each student is required to provide either on application for admission or on personal data forms required for registration, his/her complete, legal name. Any requests to change a name, by means of alteration, deletion, substitution or addition, must be accompanied by appropriate supporting documentation.

## Student Confidentiality and Release of Student Information Policy Excerpt

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The University undertakes to protect the privacy of each student and the confidentiality of his or her record. To this end the University shall refuse to disclose personal information to any person other than the individual to whom the information relates where disclosure would constitute an unjustified invasion of the personal privacy of that person or of any other individual. All members of the University community must respect the confidential nature of the student information which they acquire in the course of their work.

Complete policy at <http://www.uoguelph.ca/policies>.



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## IX. Graduate Programs

This is where you'll find academic information on our graduate programs, including program-specific admission and degree regulations, course offerings and a listing of the faculty.

### Degree Programs listed by College

#### College of Arts

Art History and Visual Culture  
Creative Writing  
English  
European Studies  
French  
History - Tri-University Program  
Latin American and Caribbean Studies  
Philosophy  
Literary Studies/Theatre Studies in English  
Studio Art  
Theatre Studies

#### College of Biological Science

Human Health and Nutritional Sciences  
Integrative Biology  
Molecular and Cellular Biology

#### College of Business and Economics

Business Administration

- Food and Agribusiness Management
- Hospitality and Tourism
- Sustainable Commerce

Economics  
Leadership  
Management  
Marketing and Consumer Studies  
Tourism and Hospitality

#### College of Engineering and Physical Science

Chemistry  
Computational Sciences  
Computer Science  
Engineering  
Mathematics and Statistics  
Physics

#### College of Social and Applied Human Sciences

Criminology and Criminal Justice Policy  
Family Relations and Applied Nutrition  
Geography  
Political Science  
Psychology  
Public Issues Anthropology  
Sociology

#### Ontario Agricultural College

Animal Biosciences  
Capacity Development and Extension  
Environmental Sciences  
Food, Agricultural and Resource Economics  
Food Science  
Landscape Architecture  
Plant Agriculture  
Rural Planning and Development  
Rural Studies

#### Ontario Veterinary College

Biomedical Sciences  
Clinical Studies  
Pathobiology  
Population Medicine  
Public Health  
Veterinary Science

### Interdepartmental Programs

Interdepartmental programs involve faculty members across departments.

Bioinformatics  
Biophysics  
Biotechnology  
Food Safety and Quality Assurance

### Degree Programs listed by Division

#### Human and Animal Sciences

Animal Biosciences  
Biomedical Sciences  
Biophysics  
Clinical Studies  
Environmental Sciences  
Family Relations and Applied Nutrition  
Food Science  
Food Safety and Quality Assurance  
Human Health and Nutritional Sciences  
Molecular and Cellular Biology  
Pathobiology  
Population Medicine  
Psychology  
Public Health

#### Humanities

Art History and Visual Culture  
Creative Writing  
English  
European Studies  
French  
History - Tri-University Program  
Latin American and Caribbean Studies  
Philosophy  
Literary Studies/Theatre Studies in English  
Studio Art  
Theatre Studies

#### Physical and Engineering Sciences

Bioinformatics  
Biophysics  
Chemistry  
Computational Sciences  
Computer Science  
Engineering  
Environmental Sciences  
Geography  
Mathematics and Statistics  
Physics

#### Plant Sciences

Environmental Sciences  
Integrative Biology  
Molecular and Cellular Biology  
Plant Agriculture

#### Social Sciences

Business Administration  
Capacity Development and Extension  
Criminology and Criminal Justice Policy  
Economics  
Family Relations and Applied Nutrition  
Food, Agricultural and Resource Economics  
Geography  
Landscape Architecture  
Leadership

Marketing and Consumer Studies  
Political Science  
Psychology  
Public Issues Anthropology  
Sociology  
Rural Planning and Development  
Rural Studies  
Tourism and Hospitality

## Animal Biosciences

In addition to a core group of faculty members the Department of Animal Biosciences works closely with professionals from the Ontario Ministry of Agriculture and Food (OMAF), Agriculture and Agri-Food Canada (AAFC), and other affiliated organizations. The graduate program encompasses MSc by course-work, MSc by thesis, and PhD options in four main fields:

- **Animal Breeding and Genetics** (quantitative or molecular)
- **Animal Nutrition** (monogastric or ruminant)
- **Animal Physiology** (environmental and reproductive)
- **Animal Behaviour and Welfare**

### Administrative Staff

#### Chair

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#### Graduate Program Coordinator

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### Graduate Faculty

\*Please see the Department's webpage at [www.aps.uoguelph.ca](http://www.aps.uoguelph.ca) for an updated listing of faculty.

#### Christine Baes

BSc Guelph, MSc Hohenheim, PhD Christina-Albrechts - Assistant Professor

#### Gregory Bedecarrats

Licence de Biochimie, MSc, Dipl. Rennes (France), PhD McGill - Associate Professor

#### Dominique P. Bureau

BSc (Agr), MSc Laval, PhD Guelph - Professor

#### Angela Canovas

BSc Lledia, MSc Valencia, PhD Lledia - Assistant Professor

#### John P. Cant

BSc (Agr) Nova Scotia, MS, PhD California - Professor

#### Abigail Carpenter

BS Michigan, MS Minnesota, PhD Kansas State - Assistant Professor

#### Trevor Devries

BSc, PhD British Columbia - Associate Professor

#### Ming Z. Fan

BS Xinjiang, MS Harbin, PhD Alberta - Professor

#### James France

BSc Cardiff, MSc, PhD, DSc Hull (United Kingdom), CMath, CSci, FIMA - Professor and Senior Canada Research Chair

#### Alexandra Harlander

DVM, DVSC Vienna, Ph.D. Germany - Assistant Professor

#### Lee-Anne Huber

BSc, MSc, PhD Guelph - Assistant Professor

#### Niel A. Karrow

BSc Guelph, MSc, PhD Waterloo - Associate Professor

#### Elijah Kiarie

BSc, MSc Nairobi, PhD Manitoba - Assistant Professor

#### Julang Li

MSc Changchun Veterinary College (China), PhD Ottawa - Professor

#### Ira B. Mandell

BS, MS Ohio State, PhD Saskatchewan - Associate Professor

#### Georgia Mason

BA, PhD Cambridge - Professor

#### Katrina Merkies

BSc, PhD Guelph - Associate Professor

#### Richard D. Moccia

BSc, MSc Guelph - Professor

#### Vern R. Osborne

BSc, MSc, PhD Guelph - Associate Professor

#### Wendy Pearson

BSc, MSc, PhD Guelph - Assistant Professor

#### Eduardo Ribeiro

DVM Santa Catarina State, MSc, PhD Florida - Assistant Professor

#### J. Andrew B. Robinson

BSc (Agr), MSc Guelph, PhD Cornell - Associate Professor

#### Flavio S. Schenkel

BBA, BSc, and MSc Brazil, PhD Guelph - Professor

#### Anna Kate Shoveller

BSc Guelph, PhD Alberta - Assistant Professor

#### E. James Squires

BSc, MSc, PhD Memorial - Professor and Interim Chair

#### Tina M. Widowski

BS, MS, PhD Illinois - Professor

#### Katie Wood

BSc, MSc, PhD Guelph - Assistant Professor

### MSc Program

The MSc program involves advanced courses and the completion of a research project. These are means of developing the skills and intellectual curiosity that may further qualify the student for a leadership role within animal organizations and industries or serve as a prerequisite for doctoral studies. The MSc degree may be completed via two routes: by thesis or by coursework and major paper. The MSc by coursework and major paper is offered in four areas of specialization: 1) animal breeding and genetics, 2) animal nutrition, 3) animal behaviour and welfare and 4) animal physiology.

### Admission Requirements

An honours baccalaureate, with a minimum average grade of 'B' during the last 2 years of full-time equivalent study. For Canadian degrees, we interpret this as the last 20 semester courses, however we do not split a semester and we will not consider any fewer than 16 courses.

### Degree Requirements

Students enrol in one of two study options: 1) thesis, or 2) course work and major research paper.

#### Thesis

Candidates for the thesis-based MSc degree must successfully complete a prescribed series of courses, conduct a research project, prepare a thesis based on their results and defend this in a final examination. The number of course credits required in this option will be decided by the student's advisory committee in consultation with the student, and may exceed the minimum 1.5 credits required by the Faculty of Graduate Studies. Generally, 4 or 5 courses (1.5-2.0 credits) will be taken, including the mandatory Seminar course, ANSC\*6600 and ANSC\*6610 (0.25 credits each).

#### Course Work and Major Research Paper (MRP)

Candidates for the MSc degree by course work and major paper option must complete a minimum of 4.0 credits (9 courses). Of these courses, one will be the departmental Seminar course, ANSC\*6600 (0.25 credit), and another will be Major Paper in Animal and Poultry Science, ANSC\*6900 (1.0 credit). The major paper will be a detailed, critical review of an area of study related to the specialization chosen by the student and should include analyses and interpretations of relevant data. The content of the major paper will be presented to the department in the Seminar course.

At the beginning of the program, the student and student's advisory committee will design the coursework program according to the program guidelines and the aspirations and background of the student. Students will normally choose a minimum of 4 courses in the area of specialization, and a minimum of two courses outside the area of specialization. These latter courses can be offered by departments other than Animal Biosciences.

A maximum of one approved senior-level undergraduate course can be included in the list of prescribed courses. Recommended graduate courses in the three areas of specialization are as follows:

#### Animal Breeding and Genetics

ANSC*6900	[1.00]	Major Paper in Animal and Poultry Science
ANSC*6210	[0.50]	Principles of Selection in Animal Breeding
ANSC*6370	[0.50]	Quantitative Genetics and Animal Models
ANSC*6390	[0.50]	QTL and Markers
ANSC*6450	[0.50]	Topics in Animal Biotechnology

#### Animal Nutrition and Metabolism

ANSC*6900	[1.00]	Major Paper in Animal and Poultry Science
ANSC*6010	[0.50]	Topics in Comparative Animal Nutrition
ANSC*6030	[0.50]	Modelling Metabolic Processes
ANSC*6360	[0.50]	Techniques in Animal Nutrition Research
ANSC*6450	[0.50]	Topics in Animal Biotechnology
ANSC*6460	[0.50]	Lactation Biology
ANSC*6470	[0.50]	Advanced Animal Nutrition and Metabolism I
ANSC*6480	[0.50]	Advanced Animal Nutrition and Metabolism II

#### Animal Behaviour and Welfare

ANSC*6900	[1.00]	Major Paper in Animal and Poultry Science
ANSC*6440	[0.50]	Advanced Critical Analysis in Applied Ethology
ANSC*6700	[0.50]	Animals in Society: Historical and Global Perspectives on Animal Welfare
ANSC*6710	[0.50]	Assessing Animal Welfare in Practice
ANSC*6720	[0.50]	Scientific Assessment of Affective States in Animals
ANSC*6730	[0.50]	Applied Environmental Physiology and Animal Housing

ANSC\*6740 [0.50] Special Topics in Applied Animal Welfare Science  
 UNIV\*6030 [0.50] Seminars and Analysis in Animal Behaviour and Welfare  
 The MSc by coursework and major paper degree will require a minimum of three semesters of full-time study (or the equivalent).

### PhD Program

The PhD program is research oriented and provides instruction and experiences that develop the student's ability to independently formulate hypotheses and design and execute experiments or conduct observational studies to reach definitive conclusions.

### Admission Requirements

Students entering a PhD program should show potential for independent, productive, and original research. A PhD program can be entered by three routes: following completion of an MSc program; following transfer prior to completion of an MSc program; and directly from a bachelor degree.

In general, a minimum average grade of 'B' for a completed MSc program plus strong letters of reference are required. Students wishing to be considered for transfer to a PhD program prior to completion of the MSc program must request the transfer before the end of the fourth semester and have an excellent academic record as well as a strong aptitude for research.

Direct admission to the PhD program may be permitted for applicants who hold a bachelor's degree and have an excellent academic history and strong indications of research potential.

### Degree Requirements

Satisfactory completion of a PhD program requires a comprehensive knowledge of the area of emphasis and the ability to conduct original research in this area, plus a sound general background in two related areas of study. This competence is demonstrated in a qualifying examination and through the design and execution of a substantial and original research project. Based on this research, a thesis is prepared and defended in a final examination.

The number of courses required for a PhD program will be decided by the student's advisory committee in consultation with the student. The minimum requirement is ANSC\*6620 and ANSC\*6630.

### Collaborative Specializations

#### Neuroscience

The Department of Animal Biosciences participates in the MA/MSc/PhD collaborative specialization in neuroscience. Please consult the Neuroscience listing for a detailed description of the MA/MSc/PhD collaborative specialization.

#### Toxicology

The Department of Animal Biosciences participates in the MSc/PhD collaborative specialization in toxicology. The research and teaching expertise of these faculty include aspects of toxicology; they may serve as advisors for MSc and PhD students in Toxicology. Students choosing this option must meet the requirements of the Toxicology collaborative specialization, as well as those of their home department. Please consult the Toxicology listing for a detailed description of the MSc/PhD collaborative specialization.

### Courses

Although the courses offered are listed by field, several are relevant to more than one field. Some courses are only offered when there is a certain minimum enrolment.

### Animal Breeding and Genetics

<b>ANSC*6210 Principles of Selection in Animal Breeding W [0.50]</b>
Definition of selection goals, prediction of genetic progress and breeding values, and the comparison of selection programs. <i>Department(s):</i> Department of Animal Biosciences
<b>ANSC*6240 Topics in Animal Genetics and Genomics F [0.50]</b>
Current literature and classical papers pertaining to quantitative genetics, animal breeding and animal genomics are reviewed in detail through presentation, discussion and critical analysis. <i>Department(s):</i> Department of Animal Biosciences
<b>ANSC*6370 Quantitative Genetics and Animal Models F [0.50]</b>
The course covers quantitative genetics theory associated with animal models; linear models applied to genetic evaluation of animals; estimation of genetic parameters for animal models; and computing algorithms for large datasets. <i>Department(s):</i> Department of Animal Biosciences
<b>ANSC*6390 QTL and Markers W [0.50]</b>
Advanced training in QTL mapping and selection assisted by genetic markers. <i>Department(s):</i> Department of Animal Biosciences

<b>ANSC*6450 Topics in Animal Biotechnology F [0.50]</b>
The course will explore current methods and recent advances of biotechnology, innovation, and emerging translational products of significance to animal production and human health. <i>Prerequisite(s):</i> MCB*2050 / MBG*2040 / ANSC*4050 or equivalent <i>Department(s):</i> Department of Animal Biosciences

### Animal Nutrition

<b>ANSC*6010 Topics in Comparative Animal Nutrition F [0.50]</b>
Current topics in the feeding and nutrition of agricultural, companion and captive animal species. Emphasis is placed on the influence of nutrients on metabolic integration at tissue, organ and whole-animal levels. A nutritional case study will be conducted to allow students to solve practical feeding problems by applying basic nutritional principles. The course is offered every other year on even years. <i>Department(s):</i> Department of Animal Biosciences
<b>ANSC*6030 Modelling Metabolic Processes F [0.50]</b>
Building and testing of mathematical models of metabolic processes using continuous simulation software to assist in weekly assignments. Choice of model based on students' research interests (e.g. protein synthesis, nutrient uptake, rumen fermentation). Term project to reproduce model from scientific knowledge. <i>Department(s):</i> Department of Animal Biosciences
<b>ANSC*6360 Techniques in Animal Nutrition Research W [0.50]</b>
Theory and/or practices of techniques to evaluate feedstuffs and determine nutrient utilization in poultry, swine and ruminants is covered through lectures, short laboratories and a major project. <i>Department(s):</i> Department of Animal Biosciences
<b>ANSC*6470 Advanced Animal Nutrition and Metabolism I F [0.50]</b>
A systematic review of key aspects of energy, protein, amino acid and carbohydrate utilization and metabolism in farm animals. <i>Department(s):</i> Department of Animal Biosciences
<b>ANSC*6480 Advanced Animal Nutrition and Metabolism II W [0.50]</b>
A systematic review of key aspects of lipid, vitamin and mineral utilization and metabolism in farm animals. <i>Department(s):</i> Department of Animal Biosciences

<b>ANSC*6470 Advanced Animal Nutrition and Metabolism I F [0.50]</b>
A systematic review of key aspects of energy, protein, amino acid and carbohydrate utilization and metabolism in farm animals. <i>Department(s):</i> Department of Animal Biosciences
<b>ANSC*6480 Advanced Animal Nutrition and Metabolism II W [0.50]</b>
A systematic review of key aspects of lipid, vitamin and mineral utilization and metabolism in farm animals. <i>Department(s):</i> Department of Animal Biosciences

### Animal Physiology

<b>ANSC*6400 Mammalian Reproduction W [0.50]</b>
Discussions and applications of methodology for collection and examination of gametes and embryos and for measurements of hormones in biological fluids. <i>Offering(s):</i> Offered in odd-numbered years. <i>Department(s):</i> Department of Animal Biosciences
<b>ANSC*6460 Lactation Biology F [0.50]</b>
An in-depth systems analysis of lactation, comparing the cow, pig, rat, human and seal. Mammary development from conception through to lactogenesis, lactation and involution will be covered. Hypotheses of regulation of the biochemical pathways of milk synthesis will be tested in relation to experimental observations. <i>Department(s):</i> Department of Animal Biosciences
<b>ANSC*6250 Growth and Metabolism W [0.50]</b>
Animal growth and metabolism are considered at the cellular level in a manner that extends beyond the basic disciplines of biometrics and biochemistry with attention focused on the main carcass components — muscle, fat and bone. <i>Department(s):</i> Department of Animal Biosciences

### Animal Behaviour and Welfare

<b>ANSC*6440 Advanced Critical Analysis in Applied Ethology F [0.50]</b>
Students explore the process of scientific inquiry and experimental design within the context of applied ethology research. Discussions include the peer review process, critical analyses and applications of methods for applied animal behaviour research. <i>Department(s):</i> Department of Animal Biosciences
<b>ANSC*6700 Animals in Society: Historical and Global Perspectives on Animal Welfare F [0.50]</b>
A seminar course covering society's duties to animals. Students will learn about the major ethical theories that deal with society's duties towards animals, the main scientific approaches to animal welfare, and the relationship of science to ethics. A brief history of human-animal relationships will be covered and cultural differences described. Students will use this to analyze some current issues. <i>Department(s):</i> Department of Animal Biosciences

**ANSC\*6710 Assessing Animal Welfare in Practice W,S [0.50]**

A lecture/seminar course covering the principles of applied animal welfare assessment. Students will learn what influences an animal welfare assessment and will understand the components necessary to create an effective and targeted animal welfare program for industry or regulatory application.

*Offering(s):* Winter offering on-campus, Summer offering Distance Education.

*Prerequisite(s):* ANSC\*6700

*Department(s):* Department of Animal Biosciences

**ANSC\*6730 Applied Environmental Physiology and Animal Housing W [0.50]**

A lecture/seminar course covering the principles of applied environmental physiology including temperature regulation, space requirements, animal responses to light and other aspects of the physical environment. Students pursue a topic in depth to develop or update recommended codes of practice and resource-based standards.

*Department(s):* Department of Animal Biosciences

**ANSC\*6720 Scientific Assessment of Affective States in Animals W [0.50]**

Graduate students will explore the biology and validity of behavioural and physiological techniques used in animal welfare assessment of such phenomena as: sympathetic activation, HPA functioning, stereotypic behaviour and preference responses. A combination of lecture, instructor-led discussion and student-led discussion will explore these areas of animal welfare assessment.

*Department(s):* Department of Animal Biosciences

**ANSC\*6740 Special Topics in Applied Animal Welfare Science S [0.50]**

A lecture/seminar course covering in depth topics in applied animal welfare science. The course will review the scientific research into the welfare of a specific animal species or a specific animal welfare problem common across species, focusing on the main threats to welfare, relevant indicators of welfare, and possible solutions to improve welfare.

*Department(s):* Department of Animal Biosciences

UNIV\*6030 [0.50] Seminars and Analysis in Animal Behaviour and Welfare

**General****ANSC\*6050 Biometry for Animal Sciences W [0.50]**

For students involved in animal research. The course will provide outlines of appropriate presentation and analysis of experimental data with emphasis on different analytical techniques.

*Department(s):* Department of Animal Biosciences

**ANSC\*6100 Special Project F,W,S [0.50]**

Supervised program of study in some aspect of animal and poultry science that can involve an experimental project and/or detailed analysis of the literature.

*Department(s):* Department of Animal Biosciences

**ANSC\*6490 Advanced Dairy Management W [0.50]**

A comprehensive systems science and integrative capstone course that encompasses the “closing of the loop” education of dairy production systems. Students will be exposed to real-time issues relating to dairy production from, environment, economics, nutrition, housing, health, welfare, society and agrology. This course will allow the student to practice their training from the courses they have been exposed to as undergraduates into many case study evaluations on farms provincially, nationally and internationally.

*Restriction(s):* Instructor consent required.

*Department(s):* Department of Animal Biosciences

**ANSC\*6600 Scientific Communication I U [0.25]**

This course is required for completion of a thesis-based MSc degree. Via, reading, guest lectures, online modules and in-class discussion, students will learn about the principles of effective communication, and with training and feedback create a departmental webpage and oral presentation outlining their research plans.

*Restriction(s):* Restricted to Animal Biosciences students.

*Department(s):* Department of Animal Biosciences

**ANSC\*6610 Thesis Proposal and Professional Development I U [0.25]**

This course is required for successful completion of an MSc thesis degree. With guidance and instruction, students complete a research proposal, or a literature review for their thesis. Students will also spend 8 hours on professional (e.g. via mygradskills.ca, MITAC Step workshops).

*Restriction(s):* Restricted to Animal Biosciences students.

*Department(s):* Department of Animal Biosciences

**ANSC\*6620 Scientific Communication II U [0.00]**

This course is required for successful completion of a PhD degree. Via reading, guest lectures, online modules and in-class discussion, students will learn about the principles of effective communication, and with training and feedback, create a departmental webpage and oral presentation outlining their research plans.

*Prerequisite(s):* ANSC\*6600

*Restriction(s):* Restricted to Animal Biosciences PhD students.

*Department(s):* Department of Animal Biosciences

**ANSC\*6630 Thesis Proposal and Professional Development II U [0.00]**

This course is required for successful completion of a PhD degree. Via reading, guest lectures, online modules and in-class discussion, students will learn about the principles of effective communication, and with training and feedback, create a departmental webpage and oral presentation outlining their research plans.

*Prerequisite(s):* ANSC\*6610

*Restriction(s):* Restricted to Animal Biosciences PhD students.

*Department(s):* Department of Animal Biosciences

**ANSC\*6900 Major Paper in Animal and Poultry Science F,W,S [1.00]**

A detailed, critical review of an area of study related to the specialization of students in the MSc by course work and major paper option that includes analysis and interpretation of relevant data.

*Department(s):* Department of Animal Biosciences

## Art History and Visual Culture

The MA in Art History and Visual Culture examines the production and consumption of images, objects, and spaces from varied cultures. It challenges prevailing ideas about cognition and perception, and includes the study of the ocular. Because the visual is crucial to our understandings of cultural difference, Art History and Visual Culture Studies is vitally concerned with the manner in which the interdependent elements of race, ethnicity, gender, sexuality, and class construct identity. It demands that we think across cultures and national boundaries, and within a global context. Students will learn to discuss and critically write about objects and images in their material, critical, theoretical, and contextual totalities. Students will also explore the concept of identity, the power of visual rhetoric, and the shifting power dynamics inherent in art and its disciplines both in historical and contemporary contexts.

### Administrative Staff

#### Sally Hickson

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### Graduate Faculty

#### Amanda Boetzkes

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#### Susan J. Douglas

BA Western Ontario, MA Carleton, PhD Concordia - Assistant Professor

#### Sally Hickson

BA Carleton, MA, PhD Queen's - Associate Professor and Director

#### Dominic J. Marner

BA Regina, MA Victoria, PhD East Anglia (UK) - Associate Professor

#### Christina Smylitopoulos

BA Victoria, MA University of York, PhD McGill - Assistant Professor

### MA Program

The MA program is intended to provide students with core knowledge about Art History and Visual Culture within an interdisciplinary research context beneficial for transition to higher levels of Art History-related education and research and/or for careers in a variety of Art History-related fields, for instance in art publishing, museums and galleries, or government agencies.

The program aims to prepare students for future study and research at the doctoral level, either in the core discipline or a related disciplinary program. It will provide students intending to go on to a variety of other academic and non-academic professional programs with expertise in Visual Culture, proficiency in a language other than English and advanced skills in research and writing. Further, it offers education for students intending to pursue professions in which knowledge about Visual Material and solid training in research is critical for success.

Towards this end, the objectives of the MA program are:

1. To enable students to gain a command of visual literacy through global and critical understandings of art and its cultures and histories;
2. To combine art historical methodology and visual and material culture perspectives in the study of objects—both past and present;
3. To explore critically the assumptions underpinning writing about art history and visual culture.

### Admission Requirements

Admission to the MA program in Art History and Visual Culture may be granted on the recommendation of the School of Fine Art and Music to:

- the holder of a BA degree (honours equivalent), or an honours BA (or its equivalent in art history) with a minimum of a 75% average; or
- in exceptional cases, the holder of a degree in another field who has completed a minimum of six one-semester courses in art history; or
- a student who has satisfied the requirements for transfer from the provisional-student category.

It is highly recommended that applicants complete at least eight semesters of courses in art history, cultural studies, or related areas prior to applying. Serious interest in, and substantial familiarity with, historical and contemporary issues in Art History and Visual Culture is expected.

### Degree Requirements

Students enrol in one of two study options: 1) course work and major research paper, or 2) thesis.

### Course Work and Major Research Paper (MRP)

In the course work and major research paper option students must complete the three (3) core courses, three (3) electives and a course-based major research paper (MRP) of 10,000-15,000 words.

Core Courses:

AVC*6100	[0.50]	Proseminar: Critical Methods I
AVC*6200	[0.50]	Proseminar: Critical Methods II
AVC*6300	[0.50]	Special Topics in Art History and Visual Culture

Two (2) of the electives must be selected from the following list of courses. The third elective may also be from this list, or it may be an approved course from another College of Arts program. The courses selected must be acceptable to the school and the Board of Graduate Studies for graduate credit.

AVC*6310	[0.50]	Topics in Art & Visual Culture I
AVC*6320	[0.50]	Topics in Art & Visual Culture II
AVC*6330	[0.50]	Topics in Art & Visual Culture III
AVC*6340	[0.50]	Topics in Art & Visual Culture IV
AVC*6350	[0.50]	Topics in Art & Visual Culture V
AVC*6370	[0.50]	Practicum I: Art Institutions
AVC*6400	[0.50]	Practicum II: Art Institutions

Students must complete a Major Research Paper (MRP) of 10,000-15,000 words. Students register for the following:

AVC*6800	[1.00]	Art History and Visual Culture Major Research Paper
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Students must obtain an overall average grade of at least 'B-' standing.

### Thesis

In the thesis option, students must complete three (3) core courses, one (1) elective and a thesis.

Core Courses:

AVC*6100	[0.50]	Proseminar: Critical Methods I
AVC*6200	[0.50]	Proseminar: Critical Methods II
AVC*6300	[0.50]	Special Topics in Art History and Visual Culture

Electives:

AVC*6310	[0.50]	Topics in Art & Visual Culture I
AVC*6320	[0.50]	Topics in Art & Visual Culture II
AVC*6330	[0.50]	Topics in Art & Visual Culture III
AVC*6340	[0.50]	Topics in Art & Visual Culture IV
AVC*6350	[0.50]	Topics in Art & Visual Culture V
AVC*6370	[0.50]	Practicum I: Art Institutions
AVC*6400	[0.50]	Practicum II: Art Institutions
AVC*6500	[0.50]	Directed Reading

One elective may be an approved course from another College of Arts program. The courses selected must be acceptable to the school and the Board of Graduate Studies for graduate credit. Students must obtain an overall average grade of at least 'B-' standing.

### Thesis

Students will also complete a thesis, consisting of an extensive piece of research of 30,000-35,000 words, a public colloquium, and an oral examination. The thesis topic is subject to the approval of the MA Examination Committee, which includes an examiner from the profession. The thesis is a project of publishable quality. In essay form, it discusses the critical, historical, and theoretical aspects of the student's subject of research. Students are expected to present and defend their work orally in a manner appropriate to a professional art historian's public presentation.

### Courses

#### Core Courses

AVC*6100 Proseminar: Critical Methods I F [0.50]	
This proseminar explores the histories, theories, and methodologies of the fields of art history, visual culture, and material culture.	
Department(s): School of Fine Art and Music	
AVC*6200 Proseminar: Critical Methods II W [0.50]	
This seminar is a multi-disciplinary survey of critical theory. The aim is to consider which bodies of theory have been—and continue to be—lively options for the practice of critical thought in relation to visual culture, especially post-1968. The course explores issues which also possess cultural, social and political relevance, theories which affected all the humanities and social sciences, and themes that are also deeply relevant outside the academy. These include: the institutions and networks of knowledge, identity politics, race, sexuality, gender and class, amongst others.	
Prerequisite(s): AVC*6100	
Department(s): School of Fine Art and Music	
AVC*6300 Special Topics in Art History and Visual Culture F [0.50]	
This seminar explores issues of historical and critical method by focusing them through the lens of a particular area of concern within the fields of art history, visual culture, and/or material culture.	
Department(s): School of Fine Art and Music	

**Elective Courses****AVC\*6310 Topics in Art & Visual Culture I W [0.50]**

This seminar course is designed to explore one or more issues in Art and Visual Culture depending on the expertise of the instructor. Offered in conjunction with ARTH\*4310. Extra work is required of graduate students. Students should consult the department for specific offerings.

*Restriction(s):* Credit may be obtained for only one of AVC 6310 or ARTH 4310.

*Department(s):* School of Fine Art and Music

**AVC\*6320 Topics in Art & Visual Culture II F [0.50]**

This seminar course is designed to explore one or more issues in Art and Visual Culture depending on the expertise of the instructor. Offered in conjunction with ARTH\*4320. Extra work is required of graduate students. Students should consult the department for specific offerings.

*Restriction(s):* Credit may be obtained for only one of AVC 6320 or ARTH 4320.

*Department(s):* School of Fine Art and Music

**AVC\*6330 Topics in Art & Visual Culture III W [0.50]**

This seminar course is designed to explore one or more issues in Art and Visual Culture depending on the expertise of the instructor. Offered in conjunction with ARTH\*4330. Extra work is required of graduate students. Students should consult the department for specific offerings.

*Restriction(s):* Credit may be obtained for only one of AVC 6330 or ARTH 4330

*Department(s):* School of Fine Art and Music

**AVC\*6340 Topics in Art & Visual Culture IV F [0.50]**

This seminar course is designed to explore one or more issues in Art and Visual Culture depending on the expertise of the instructor. Offered in conjunction with ARTH\*4340. Extra work is required of graduate students. Students should consult the department for specific offerings.

*Restriction(s):* Credit may be obtained for only one of AVC 6340 or ARTH 4340.

*Department(s):* School of Fine Art and Music

**AVC\*6350 Topics in Art & Visual Culture V F [0.50]**

This seminar course is designed to explore one or more issues in Art and Visual Culture depending on the expertise of the instructor. Offered in conjunction with ARTH\*4350. Extra work is required of graduate students. Students should consult the department for specific offerings.

*Restriction(s):* Credit may be obtained for only one of AVC 6350 or ARTH 4350.

*Department(s):* School of Fine Art and Music

**AVC\*6370 Practicum I: Art Institutions F [0.50]**

The practicum provides students with an opportunity to gain practical experience through work with an artist, curator, or other museum or arts professional. This experience may be based in a museum department, gallery, artist's studio, or arts publication office. The course should result in a substantial piece of work - for example, preparatory work for an exhibition, an analysis of a segment of a permanent collection, or a survey or catalogue of an artist's archives. The student is required to submit a written report upon completion of the course.

*Restriction(s):* Admission to the Graduate Program in Art History and Visual Culture  
Instructor consent required.

*Department(s):* School of Fine Art and Music

**AVC\*6400 Practicum II: Art Institutions W [0.50]**

The practicum provides students with an opportunity to gain practical experience through work with an artist, curator, or other museum or arts professional. This experience may be based in a museum department, gallery, artist's studio, or arts publication office. The course should result in a substantial piece of work - for example, preparatory work for an exhibition, an analysis of a segment of a permanent collection, or a survey or catalogue of an artist's archives. The student is required to submit a written report upon completion of the course.

*Restriction(s):* Admission to the Graduate Program in Art History and Visual Culture  
Instructor consent required.

*Department(s):* School of Fine Art and Music

**AVC\*6500 Directed Reading U [0.50]**

Each student establishes, in consultation with the faculty member chosen, the content of this special study within the instructor's area of expertise. Faculty varies.

*Department(s):* School of Fine Art and Music

**Other Courses****AVC\*6800 Art History and Visual Culture Major Research Paper F,W,S [1.00]**

The Master's Research Project is a 10,000-15,000 word paper that requires original research and argumentation.

*Restriction(s):* Admission to the Graduate Program in Art History and Visual Culture,  
course-work students only

*Department(s):* School of Fine Art and Music

## Bioinformatics

Bioinformatics is the development and application of computational and statistical techniques for solving problems involving complex biological data. This emerging discipline is growing rapidly alongside technological developments for large-scale data generation in the life sciences, such as in genomics, proteomics, functional pathway analysis, health sciences, and biodiversity. Demand is accelerating for new approaches for data storage, retrieval, analysis, and applications. A new generation of professionals is required to meet this demand, having bioinformatics skills and the capacity to create new approaches.

### Administrative Staff

#### Director

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### Graduate Faculty

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#### Daniel Ashlock

Professor, Mathematics and Statistics

#### Christine Baes

Assistant Professor, Animal Biosciences

#### Elizabeth Boulding

Professor, Integrative Biology

#### Angela Canovas

Assistant Professor, Animal Biosciences

#### David Chiu

Professor, Computer Science

#### Joseph Colasanti

Associate Professor, Molecular and Cellular Biology

#### Brenda L. Coomber

Professor, Biomedical Sciences

#### Karl Cottenie

Associate Professor, Integrative Biology

#### Roy G. Danzmann

Professor, Integrative Biology

#### Hermann Eberl

Professor and Canada Research Chair, Mathematics and Statistics

#### Michael J. Emes

Professor, Molecular and Cellular Biology

#### Zeny Feng

Associate Professor, Mathematics and Statistics

#### Steffen Graether

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#### T. Ryan Gregory

Associate Professor, Integrative Biology

#### Cortland K. Griswold

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#### Mehrdad Hajibabaei

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#### Robert Hanner

Associate Professor, Integrative Biology

#### George Harauz

Professor and Canada Research Chair, Molecular and Cellular Biology

#### Andreas Heyland

Associate Professor, Integrative Biology

#### Julie Horrocks

Professor and Associate Chair, Mathematics and Statistics

#### Ronald Johnson

Associate Professor, Biomedical Sciences

#### Niel A. Karrow

Associate Professor, Animal Biosciences

#### Stefan Keller

Assistant Professor, Pathobiology

#### Peter Kim

Professor, Mathematics and Statistics

#### Stefan C. Kremer

Associate Professor, Computer Science

#### Jonathan LaMarre

Professor, Biomedical Sciences

#### Brandon N. Lillie

Associate Professor, Pathobiology

#### Lewis Lukens

Associate Professor, Plant Agriculture

#### David W.L. Ma

Associate Professor, Human Health and Nutritional Sciences

#### Janet I. MacInnes

Professor, Pathobiology

#### Baozhong Meng

Associate Professor, Molecular Cellular Biology

#### Rod Merrill

Professor, Molecular and Cellular Biology

#### Robert Mullen

Professor and University Research Chair, Molecular and Cellular Biology

#### David M. Mutch

Associate Professor, Human Health and Nutritional Sciences

#### Annette Nassuth

Associate Professor, Molecular and Cellular Biology

#### K. Peter Pauls

Professor, Plant Agriculture

#### J. Andrew B. Robinson

Associate Professor, Animal Biosciences

#### Steven Rothstein

Professor and University Research Chair, Molecular and Cellular Biology

#### Flavio Schenkel

Professor, Animal Biosciences

#### M. Alexander Smith

Associate Professor, Integrative Biology

#### Graham Taylor

Associate Professor, Engineering

#### George van der Merwe

Associate Professor, Molecular and Cellular Biology

#### Terry Van Raay

Associate Professor, Molecular and Cellular Biology

#### Geoffrey Wood

Associate Professor, Pathobiology

### Associated Graduate Faculty

#### Sanjeena Dang

BSc, MSc, PhD Guelph - Contractually Limited Assistant Professor, Mathematics and Statistics, University of Guelph

#### Brian Golding

BSc Dalhousie, PhD Alberta - Professor, Biology, McMaster University

#### Paul McNicholas

BA, MSc, PhD Trinity College, Dublin - Associate Professor, Mathematics and Statistics, McMaster University

#### John Nash

BSc, PhD Monash University, Melbourne, Australia - Senior Research Scientist, Division of Enteric Diseases, National Microbiology Laboratory, Public Health Agency of Canada

### MBINF Program

### Admission Requirements

Students will be admitted to the Master of Bioinformatics program from a range of undergraduate programs in the life sciences. Students from undergraduate programs in the physical or computational sciences will be considered for admission if they are considered to have sufficient biological background. Students must begin the Master of Bioinformatics program in a fall semester. To be considered for admission, applicants should meet the minimum requirements of a four-year degree from a recognized post-secondary institution with a minimum 75% average over the last two years of full-time equivalent study.

Space in the program is limited and prospective students are encouraged to apply as early as possible. Application details are posted on [the program website](#).

### Degree Requirements

A total of 4.0 credits are required, which must include:

BINF*6110	[0.50]	Genomic Methods for Bioinformatics
BINF*6210	[0.50]	Software Tools for Biological Data Analysis and Organization
BINF*6890	[0.50]	Topics in Bioinformatics
BINF*6970	[0.50]	Statistical Bioinformatics
BINF*6999	[1.00]	Bioinformatics Master's Project

The advisory committee and/or the Graduate Program Committee may require additional courses.

### Advisory Committee

Students taking the Master of Bioinformatics will have an advisor and a co-advisor. Both the advisor and the co-advisor must be members of the Bioinformatics Graduate Faculty such that one has expertise in the life sciences and the other has expertise in statistics or computing.

### Duration of the Program

Students normally take 3 courses per semester for two semesters (3.0 credits) and complete the Bioinformatics Master's Project (1.0 credit) in a third semester. Therefore, the program typically takes 12 months of full-time study. There is, however, the option to continue the Bioinformatics Master's Project into a second fall semester, in which case the program will take 16 months of full-time study.

## MSc Program

### Admission Requirements

Students may be admitted to the MSc in Bioinformatics program from a range of undergraduate programs in the life, physical, statistical, mathematical, and computational sciences. To be considered for admission, applicants should meet the minimum requirements of a four-year degree from a recognized post-secondary institution with a minimum 75% average over the last two years of full-time equivalent study.

Applicants should indicate their research interests and their preferred advisors. Prospective students are encouraged to speak with potential advisors before applying to the MSc program. Offers of admission will only be issued in cases where a member of Bioinformatics Graduate Faculty has agreed to be the advisor.

### Degree Requirements

A total of 2.0 credits are required, which must include:

BINF*6110	[0.50]	Genomic Methods for Bioinformatics
BINF*6210	[0.50]	Software Tools for Biological Data Analysis and Organization

The advisory committee and/or the Graduate Program Committee may require additional courses. When the course work is satisfactorily completed, the submission and successful defence of an appropriate thesis on an approved topic completes the requirements for the MSc in Bioinformatics.

### Advisory Committee

Students taking the MSc in Bioinformatics will have an advisory committee comprising at least two members of the Bioinformatics Graduate Faculty. The advisor must be a member of the Bioinformatics Graduate Faculty.

### Duration of the Program

The program typically takes 16-24 months of full-time study.

## PhD Program

### Admission Requirements

1. Applicants with a master's degree

Applicants holding either a Master of Bioinformatics, an MSc in Bioinformatics, or a masters in a related discipline with a GPA above 80 over the last two years equivalent of full time study will be considered for admission.

2. Applicants without a master's degree (i.e., direct entry)

Strong applicants (GPA>80) may be admitted without holding a master's degree provided that their undergraduate major is appropriate. In these cases, the program committee will assign necessary courses to ensure sufficient preparedness for research.

3. General Requirements

Before a recommendation of admission can be issued, applicants are encouraged to speak with potential advisors before applying to the PhD in Bioinformatics program.

### Degree Requirements

A minimum of 1.0 credit is required, which must include:

BINF*6500	[1.00]	PhD Research Writing in Bioinformatics
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The program committee and the advisory committee may, and usually will, require additional courses. After the prescribed course work is satisfactorily completed, a qualifying examination is taken. Finally, the submission and successful defence of an appropriate thesis on an approved topic completes the requirements for the PhD in Bioinformatics.

## Advisory Committee

Students taking the PhD in Bioinformatics will have an advisory committee comprising at least three members of the Graduate Faculty, two of whom should be Bioinformatics Graduate Faculty. The advisor must be a member of the Bioinformatics Graduate Faculty. Usually, if there is a co-advisor, (s)he will also be a member of the Bioinformatics Graduate Faculty; under special circumstances, the Director, after consultation with the Bioinformatics Program Committee, may approve a co-advisor who is not a member of the Bioinformatics Graduate Faculty.

### Duration of the Program

The completion period of the program is 12 semesters of full-time study.

## Courses

### Bioinformatics Core Courses

<b>BINF*6110 Genomic Methods for Bioinformatics W [0.50]</b>	
This course provides an introduction to current and emerging methods used to generate genomic data analyzed in bioinformatics. This may include techniques for DNA sequencing as well as transcriptome, proteome and metabolome analysis. The objective is to develop an appreciation for the challenges of producing data.	
<i>Restriction(s):</i>	Restricted to students in Bioinformatics programs. Students in other programs may consult with course instructor.
<i>Department(s):</i>	Dean's Office, College of Biological Science
<b>BINF*6210 Software Tools for Biological Data Analysis and Organization F [0.50]</b>	
This course will familiarize students with tools for the computational acquisition and analysis of molecular biological data. Key software for gene expression analyses, biological sequence analysis, and data acquisition and management will be presented. Laboratory exercises will guide students through application of relevant tools.	
<i>Restriction(s):</i>	Restricted to students in Bioinformatics programs. Students in other programs may consult with course instructor.
<i>Department(s):</i>	Dean's Office, College of Biological Science
<b>BINF*6410 Bioinformatics Programming F [0.50]</b>	
This course will introduce bioinformatics students to programming languages. Languages such as C and Perl will be introduced with a focus on bioinformatics applications. The topics covered will serve to aid students when existing software does not satisfy their needs.	
<i>Restriction(s):</i>	Restricted to students in Bioinformatics programs. Students in other programs may consult with course instructor.
<i>Department(s):</i>	Dean's Office, College of Biological Science
<b>BINF*6420 Biosequence Pattern Analysis W [0.50]</b>	
This course is an overview course on different approaches to analyze biological sequences. Basic concepts are introduced, as well as related algorithms.	
<i>Restriction(s):</i>	Restricted to students in Bioinformatics programs. Students in other programs may consult with course instructor.
<i>Department(s):</i>	Dean's Office, College of Biological Science
<b>BINF*6500 PhD Research Writing in Bioinformatics F,W,S [1.00]</b>	
Background literature pertinent to the student's initial research direction will be studied. Starting with a reading list provided by the advisor and the instructor, the student will build on this list and construct a major literature review over two semesters. As the student begins to generate initial ideas for their own research direction, their ideas are written and explained. The emphasis will be on a sub-field or sub-fields of bioinformatics and the depth of study will be appropriate to the doctoral level.	
<i>Restriction(s):</i>	Instructor consent required. PhD students in Bioinformatics program
<i>Department(s):</i>	Dean's Office, College of Biological Science
<b>BINF*6890 Topics in Bioinformatics F [0.50]</b>	
Selected topics in bioinformatics will be covered. The course might focus on biological or informatics topics, or upon a mixture of both.	
<i>Restriction(s):</i>	Restricted to students in Bioinformatics programs. Students in other programs may consult with course instructor.
<i>Department(s):</i>	Dean's Office, College of Biological Science
<b>BINF*6970 Statistical Bioinformatics W [0.50]</b>	
This course presents a selection of advanced approaches for the statistical analysis of data that arise in bioinformatics, especially genomic data. A central theme to this course is the modelling of complex, often high-dimensional, data structures.	
<i>Prerequisite(s):</i>	Introductory courses in statistics, mathematics and programming
<i>Restriction(s):</i>	Restricted to students in Bioinformatics programs. Students in other programs may consult with course instructor.
<i>Department(s):</i>	Dean's Office, College of Biological Science

**BINF\*6999 Bioinformatics Master's Project F,W,S [1.00]**

A major research paper is completed and presented by students in the Master of Bioinformatics program.

*Prerequisite(s):* BINF\*6110, BINF\*6210

*Restriction(s):* Restricted to MBNF students only

*Department(s):* Dean's Office, College of Biological Science

**Note**

Some courses may not be offered every year. Students planning to take a course from the above list should consult with the Graduate Program Assistant for availability and scheduling.

**Electives****Biological Sciences**

ANSC*6370	[0.50]	Quantitative Genetics and Animal Models
HHNS*6440	[0.50]	Nutrition, Gene Expression and Cell Signalling
MCB*6370	[0.50]	Protein Structural Biology and Bioinformatics
PLNT*6160	[0.50]	Advanced Plant Breeding II
PLNT*6500	[0.50]	Applied Bioinformatics

**Computer Science**

CIS*6080	[0.50]	Genetic Algorithms
CIS*6120	[0.50]	Uncertainty Reasoning in Knowledge Representation

**Mathematics and Statistics**

STAT*4340	0.50	Statistical Inference
STAT*6801	[0.50]	Statistical Learning
STAT*6802	[0.50]	Generalized Linear Models and Extensions
STAT*6950	[0.50]	Statistical Methods for the Life Sciences

**Note**

Some courses may not be offered in every semester. Students planning to take a course from the above list should consult with the department offering the course to check for availability and scheduling.

## Biomedical Sciences

The Department specializes in scientific disciplines which are basic to human and veterinary medicine. Within this context, the research activities of the faculty are focused under the general umbrella of biomedical science and biotechnology. The MBS, MSc and PhD programs provide emphasis in one of the department's four major fields:

- Reproductive Biology and Development
- Cellular and Molecular Basis of Disease
- Biomedical Toxicology and Pharmacology
- Neuroscience

The department also participates in the Doctor of Veterinary Science (DVSc) program.

### Administrative Staff

#### Chair

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#### Graduate Program Coordinator MSc and PhD

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### Graduate Faculty

#### Craig Bailey

BSc, PhD Queen's - Assistant Professor

#### Pawel M. Bartlewski

DVM Poland, MSc, PhD Saskatchewan - Associate Professor

#### Peter D. Conlon

BSc (Agr), MSc McGill, DVM, PhD Guelph - Associate Professor and Associate Dean of Students, Ontario Veterinary College

#### Brenda L. Coomber

BSc, MSc Guelph, PhD Toronto - Professor

#### W.J. Brad Hanna

BSc, DVM, MSc, PhD Guelph - Associate Professor

#### Ronald Johnson

BSc, DVM Guelph, PhD Michigan State, ACVCP - Associate Professor

#### Bettina E. Kalisch

BSc, MSc, PhD Queen's - Associate Professor

#### W. Allan King

BSc, MSc Guelph, PhD Uppsala - Professor and Canada Research Chair, Tier 1

#### Gordon Kirby

DVM Guelph, MSc Surrey, PhD Guelph - Professor and Associate Dean, Research and Innovation

#### Thomas Koch

DVM Royal Vet & Agr Univ., PhD Guelph - Assistant Professor

#### Jonathan LaMarre

DVM, PhD Guelph - Professor

#### Neil J. MacLusky

BSc Leeds, PhD London - Professor

#### Pavneesh Madan

BVSc & AH, MVSc Haryana, PhD British Columbia - Associate Professor

#### Tami Martino

BSc McMaster, MSc PhD Toronto - Associate Professor

#### Roger A. Moorehead

BSc, PhD McMaster - Professor

#### Anthony Mutsaers

DVM Guelph, PhD Toronto, ACVIM (Oncology) - Assistant Professor

#### James J. Petrik

BA, MA, PhD Western Ontario - Professor

#### W. Glen Pyle

BSc Guelph, PhD Tennessee - Professor

#### Tarek M. Saleh

BSc, PhD Western Ontario - Professor and Chair

#### Alastair J.S. Summerlee

BSc, BVSc, PhD, MRCVS Bristol - Professor

#### Jeffrey J. Thomason

BA Cambridge, MSc, PhD Toronto - Professor

#### Matthew Vickaryous

BSc, MSc Calgary, PhD Dalhousie - Associate Professor

#### Alicia Vilorio-Petit

BSc, MSc Venezuela, PhD Toronto - Assistant Professor

### Associated Graduate Faculty

#### Laura Favetta

BSc, Milan Italy, PhD Guelph - Research Associate, Biomedical Sciences, University of Guelph

#### Gabriela Mastromonaco

BSc, MSc Toronto, PhD Guelph - Curator, Reproductive Programs & Research, Toronto Zoo

#### Lisa Robertson

BSc, MSc, PhD Toronto - Contractually Limited Faculty, Biomedical Sciences, University of Guelph

### MBS program

Students may wish to focus their Master of Biomedical Sciences in a range of research areas and examples include: 1) reproductive biology and development; 2) cellular and molecular basis of disease; 3) biomedical toxicology and pharmacology; and 4) neuroscience. The research projects are varied in topic and scope and may involve: molecular, cellular or developmental aspects of tissue or animal differentiation and growth, physiological, morphological or biomechanical investigations of normal function or disease processes in a variety of organs and tissues, or pharmacological mechanisms related to therapy and drug toxicity. Projects may also involve pedagogical research related to teaching in the biomedical sciences.

### Admission Requirements

Applicants should have an Honours baccalaureate degree in the Biological Sciences or a Doctor of Veterinary Medicine degree (or the equivalent) with a minimum 'B+' standing in the final two years of study. Letters of reference from two individuals who can adequately evaluate the academic and research capabilities of the applicant must be provided with the application. In addition, a short statement of the applicant's research interests and career goals, is required to assist in the selection of faculty advisors. Students may be admitted into the Fall, Winter or Summer semester. Provisional acceptance may be granted to students who do not meet this 'B+' standard if there is additional evidence that the applicant is capable of successfully completing the graduate program (e.g., outstanding letters of recommendation, or evidence of prior relevant work or research experience). Transfer to regular status will normally be recommended when the student obtains a minimum grade of 'A-' in their first two graduate course and displays current research ability to his/her advisory committee. These courses will be credited to the degree program.

### Degree Requirements

Students must obtain at least an overall weighted average of 'B-' in prescribed courses. The number of course credits prescribed will not be fewer than 4.0 credits with BIOM\*6900 being a required course (the 1.0 credit for BIOM\*6900 is included in the total required credits of 4.0). The courses selected will depend on the student's prior experience and the nature of the research project. All students are required to present a poster seminar as a component of BIOM\*6900. The program is completed when all components of BIOM\*6900 have been submitted and the written research report for BIOM\*6900 is deemed appropriate by the Student's Supervisory Committee.

### MSc Program

Students may wish to focus their MSc degree in one of the three major fields: 1) reproductive biology and development; 2) cellular and molecular basis of disease; 3) biomedical toxicology and pharmacology and 4) neuroscience. The research project may involve: molecular, cellular or developmental aspects of tissue or animal differentiation and growth, physiological, morphological or biomechanical investigations of normal function or disease processes in a variety of organs and tissues, or pharmacological mechanisms related to therapy and drug toxicity.

### Admission Requirements

Applicants should have an Honours baccalaureate degree in the Biological Sciences or a Doctor of Veterinary Medicine degree (or the equivalent) with a minimum 'B+' standing in the final two years of study. Letters of reference from two individuals who can adequately evaluate the academic and research capabilities of the applicant must be provided with the application. In addition, a short statement of the applicant's research interests and career goals, is required to assist in the selection of faculty advisors. Students may be admitted into the Fall, Winter or Summer semester. Provisional acceptance may be granted to students who do not meet this 'B+' standard if there is additional evidence that the applicant is capable of successfully completing the graduate program (e.g., outstanding letters of recommendation, or evidence of prior relevant work or research experience). Transfer to regular status will normally be recommended when the student obtains a minimum grade of 'A-' in their first two graduate course and displays current research ability to his/her advisory committee. These courses will be credited to the degree program.

## Degree Requirements

Students must obtain at least an overall weighted average of 'B-' in prescribed courses. The number of graduate course credits prescribed will not be fewer than 1.5 credits. Prescribed and additional courses are selected by the student in consultation with the student's advisory committee. The courses selected will depend on the student's prior experience and the nature of the research project. The student must also prepare and defend an acceptable thesis and meet the Department's minimum scientific communication requirement. The minimum scientific communication requirement is one conference presentation (oral or poster) at a suitable Regional, National or International scientific conference. If this requirement has not been achieved, written justification must be provided to the Department of Biomedical Sciences Graduate Program Committee outlining the reasons why these requirements have not been achieved. The Chair of the Department of Biomedical Sciences Graduate Program Committee will provide a written response outlining the decision of the Graduate Program Committee to either grant or reject the request that the defence proceed even though the minimum scientific communication requirement has not been completed. All students are required to present two departmental seminars during their program. The thesis research proposal, developed by the student in consultation with the advisor, must receive approval from the supervisory committee no later than the end of the second semester of the program. The program is completed by the successful oral defence of a written thesis.

## PhD Program

Students may undertake a PhD degree in aspects of 1) reproductive biology and development; 2) cellular and molecular basis of disease; 3) biomedical toxicology and pharmacology; and 4) neuroscience. Wherever appropriate, students are encouraged to incorporate the methodologies of more than one of these fields into their research project. The PhD program is research based and provides instructional opportunities and experiences that are intended to develop the student's ability to formulate hypotheses and design and execute experiments or to conduct observational studies.

## Admission Requirements

Students entering the PhD program must show evidence of potential for independent, productive and original research. Admission to the PhD program generally requires completion of an MSc program with a research component, a minimum 'B+' average in the prescribed courses taken during the master's degree program, and strong recommendations from referees who have a sound knowledge of the student's strengths and weaknesses. In addition, a short statement of the applicant's research interests and career goals is required. In exceptional cases, where a candidate has demonstrated excellence in academic work and extraordinary ability to plan and initiate original research, transfer to the PhD program without completion of the MSc program may be recommended. This transfer must take place before the end of the fourth semester in accordance with university regulations. In all cases, students who do not hold an approved research-based MSc degree must register as MSc students regardless of their ultimate goals. Students may be admitted into the Fall, Winter or Summer semester. In those cases where the student is continuing her or his MSc research program into the PhD program, the student must clearly explain how the PhD research program represents a significant advance over that of the MSc.

## Degree Requirements

The PhD program offers opportunities for students to become investigators in veterinary and human-health-related sciences. Students will be expected to demonstrate the originality and skill needed to contribute to the knowledge base in a manner that transcends the mere acquisition of data. All students are required to present departmental seminars (one per annum). Students must also successfully complete a qualifying examination. Details of the qualifying examination which includes written and oral components can be found on the [Department's website](#). Successful completion of the qualifying examination is a prerequisite for continuation in the PhD program. The advisory committee is required to evaluate the student's research productivity periodically and to report on the student's progress to the Department Graduate Program Committee each semester in which the student is registered.

The PhD program culminates in the preparation, presentation and defence of the thesis, which contains a substantial component of original research. Preparation and defence of an acceptable thesis based on research data and hypotheses generated during the duration of the study are the main criteria used to assess the satisfactory completion of the PhD program. In addition the student must meet the Department's minimum scientific communication requirements. The minimum scientific communication requirements are two manuscripts which **must** at least have been submitted to a scientific journal prior to the student graduating with their PhD degree. One of these manuscripts **must** be based on the student's PhD research project and the student **must** be the first or senior author on this manuscript. The second manuscript may be either an original research manuscript or a review manuscript. The student is not required to be the first author on this manuscript but the manuscript must be generated during the student's tenure as a PhD candidate (i.e. the manuscript cannot be based on work performed while an undergraduate student or work presented in an MSc thesis). Students transferring from the MSc program to the PhD program can use any publications generated while enrolled in the graduate program of the Department of Biomedical Sciences. If these requirements have not been achieved, written justification must be provided to the Department of Biomedical Sciences Graduate Program Committee outlining the reasons why these requirements have not been achieved. The Chair of the Department of Biomedical Sciences Graduate Program Committee will provide a written response outlining the decision of the Graduate Program Committee to either grant or reject the request that the defence proceed even though the minimum scientific communication requirements have not been completed.

## DVSc Program

The Department of Biomedical Sciences participates in the DVSc program offering specialization in clinical science. This program provides a balance between advanced training in the discipline, in-service training and a thesis-research project.

## Interdepartmental Program

### Biophysics MSc/PhD

The Department of Biomedical Sciences participates in the MSc/PhD program in biophysics. Please consult the Biophysics listing for a detailed description of the MSc/PhD program.

## Collaborative Specializations

### Neuroscience

The Department of Biomedical Sciences participates in the MBS/MSc/PhD collaborative specialization in neuroscience. Please consult the Neuroscience listing for a detailed description of the MBS/MSc/PhD collaborative specialization.

### Toxicology

The Department of Biomedical Sciences participates in the MSc/PhD collaborative specialization in toxicology. The research and teaching expertise of these faculty include aspects of toxicology; they may serve as advisors for MSc and PhD students. Please consult the Toxicology listing for a detailed description of the MSc/PhD collaborative specialization.

## Courses

<b>BIOM*6070 Pregnancy, Birth and Perinatal Adaptations S [0.50]</b>
This course promotes understanding of the physiology of the placenta, and its role in fetal, perinatal and adult health. It is offered through videoconference involving University of Guelph, Queen's University and University of Waterloo. Parts are customized to student's interests within pregnancy physiology. <i>Department(s):</i> Department of Biomedical Sciences
<b>BIOM*6110 Research Methods in Biomedical Sciences F-W [0.50]</b>
To provide a theoretical and practical introduction to basic and advanced laboratory techniques for graduate students in Biomedical Sciences. Routine and specialized procedures for light microscopy and various lab techniques, including but not limited to qPCR, protein assays, HPLC, Histology, cell culture and flow cytometry, are examined. Each technique is extensively examined through lectures, discussions and practical exercises. (This is a two semester course that begins in the Fall semester.) <i>Department(s):</i> Department of Biomedical Sciences
<b>BIOM*6130 Vertebrate Developmental Biology U [0.50]</b>
The principles of vertebrate development are examined through lectures, discussions and practical exercises. Topics include aspects of gametogenesis, fertilization, implantation, embryonic and fetal development and experimental manipulation of embryos. Emphasis is on mammalian development and topics may vary depending on student needs and interests. <i>Department(s):</i> Department of Biomedical Sciences

**BIOM\*6160 Cellular Biology U [0.50]**

An integrative course that examines aspects of cell biology in the context of recent research advancements. Topics are chosen based on student interest and faculty expertise and are explored through a combination of lectures, student seminars and group discussions.

*Department(s):* Department of Biomedical Sciences

**BIOM\*6300 Cancer Biology W [0.50]**

Directed to students pursuing cancer research and based on two 1.5-hour lectures and a 2-hour tutorial per week, the general aim of this course is to familiarize students with general concepts in cancer biology and the most commonly used methodologies in cancer research. Apart from improving students' general understanding of cancer biology, the course seeks to enhance critical thinking, writing and oral presentation skills by means of a seminar presentation, weekly tutorial discussions and the preparation of two literature reviews. Offered in conjunction with BIOM\*4150. Extra work is required for graduate students.

*Restriction(s):* Credit may be obtained for only one of BIOM\*4150 or BIOM\*6300.

*Department(s):* Department of Biomedical Sciences

**BIOM\*6310 Advanced Cancer Biology F [0.50]**

This course explores advanced topics in cancer biology including cancer etiology, detection and screening and therapeutic strategies. Students will also critically evaluate the scientific literature as well as cancer related articles disseminated to the general public.

*Restriction(s):* Instructor consent required.

*Department(s):* Department of Biomedical Sciences

**BIOM\*6400 Critical Thinking in Medicinal Research F [0.50]**

This course will explore a variety of issues related to the scientific ideals and practical realities of research in the health sciences. Topics include critical thinking, critical appraisal of the medical literatures (with emphasis on clinical trials), the principles of evidence-based medicine, and selected issues related to scientific integrity.

*Prerequisite(s):* Undergraduate or graduate course in statistics.

*Department(s):* Department of Biomedical Sciences

**BIOM\*6490 Introduction to Drug Development W [0.50]**

Drug development is the process of integrating scientific data from several disciplines in order to demonstrate efficacy and safety of the new chemical entity for regulatory approval. This course will provide an overview of the drug development process including preclinical and clinical aspects of drug development.

*Restriction(s):* Instructor consent required.

*Department(s):* Department of Biomedical Sciences

**BIOM\*6570 Biochemical Regulation of Physiological Processes U [0.50]**

This course focuses on the regulation of vertebrate physiological processes, such as electrolyte and water balance, temperature regulation, growth and energy metabolism, by hormones and other biological regulators that act through cellular receptors and intracellular biochemical-control pathways.

*Department(s):* Department of Biomedical Sciences

**BIOM\*6601 Special Topics in Reproductive Biology and Biotechnology U [0.25]**

Permits in-depth exploration of interdisciplinary aspects of biomedical research. Topics such as inflammation, reproductive immunology and neoplasia have been offered.

*Department(s):* Department of Biomedical Sciences

**BIOM\*6602 Special Topics in Reproductive Biology and Biotechnology U [0.50]**

See BIOM\*6601 above.

*Department(s):* Department of Biomedical Sciences

**BIOM\*6610 Vascular Biology U [0.50]**

An interdisciplinary course in which the interrelationships between vascular proteins, cellular elements and the maintenance of vascular integrity are examined. Structural-functional relationships in vascular biology are explored through seminar presentations, group discussions and small group participation in problem based examples of vascular dysfunction.

*Department(s):* Department of Biomedical Sciences

**BIOM\*6701 Special Topics in Development, Cell and Tissue Morphology U [0.25]**

Permits further in depth study of developmental and morphological sciences.

*Department(s):* Department of Biomedical Sciences

**BIOM\*6702 Special Topics in Development, Cell and Tissue Morphology U [0.50]**

See BIOM\*6701

*Department(s):* Department of Biomedical Sciences

**BIOM\*6712 Special Topics in Physiology & Biochemistry U [0.50]**

This course involves an appropriate combination of an experimental procedure (or project), seminars, selected reading or a literature review outside the thesis subject, developed according to the student's requirements.

*Department(s):* Department of Biomedical Sciences

**BIOM\*6721 Special Topics in Pharmacology-Toxicology U [0.25]**

This course will comprise a combination of an experimental procedure (or project), seminars, selected reading or a literature review outside the thesis subject, developed based on the student's requirements. Topics could include clinical pharmacology/toxicology, pharmaco-epidemiology/economics, gerontological or perinatal pharmacology and toxicokinetics.

*Department(s):* Department of Biomedical Sciences

**BIOM\*6722 Special Topics in Biomedical Pharmacology-Toxicology U [0.50]**

See BIOM\*6721

*Department(s):* Department of Biomedical Sciences

**BIOM\*6800 Gene Expression in Health and Disease W [0.50]**

This course presents the molecular concepts of gene expression and the functional consequences of abnormal expression in pathological conditions. The conceptual, methodological and applied aspects of gene expression will be illustrated through student and faculty seminars, written reports, group discussions, and debates.

*Department(s):* Department of Biomedical Sciences

**BIOM\*6900 Research Project in Biomedical Sciences W,S,F [1.00]**

This course is a lab-based, one-semester research project course for students in the course-based Master of Biomedical Sciences (MBS). As part of this course, students will complete a research paper and grant proposal pertaining to the research topic as well as a poster presentation of the project.

*Restriction(s):* Course restricted to students registered in the course-based MBS.  
Instructor consent required.

*Department(s):* Department of Biomedical Sciences

## Biophysics

The organization and administration of the graduate program in biophysics are the responsibility of the Biophysics Interdepartmental Group (BIG). The group consists of those members of the graduate faculty whose research interests lie wholly or partly in biophysics. Biophysics spans all areas of the life sciences from molecular structure to human biology and uses the ideas and techniques of the physical sciences to solve biological problems. The specific sub-disciplines of BIG are molecular, cellular, structural, and computational biophysics.

### Administrative Staff

#### Director and Graduate Program Coordinator

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#### Graduate Program Assistant

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### Graduate Faculty

#### Josef Ackerman

Professor, Integrative Biology

#### Madhur Anand

Professor, Environmental Sciences

#### Daniel Ashlock

Professor, Mathematics and Statistics

#### France-Isabelle Auzanneau

Professor, Chemistry

#### Leah Bent

Associate Professor, Human Health and Nutritional Sciences

#### Manfred Brauer

Associate Professor, Molecular and Cellular Biology

#### Leonid Brown

Professor, Physics

#### Stephen Brown

Associate Professor, Human Health and Nutritional Sciences

#### David Chiu

Professor, Computer Science

#### John Dawson

Professor, Molecular and Cellular Biology

#### John R. Dutcher

Professor, Physics

#### Hermann Eberl

Professor, Mathematics and Statistics

#### Susan Glasauer

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#### Todd Gillis

Associate Professor, Integrative Biology

#### Steffen Graether

Associate Professor, Molecular and Cellular Biology

#### Amy Greer

Assistant Professor, Population Medicine

#### Marc Habash

Associate Professor, Environmental Sciences

#### George Harauz

Professor, Molecular and Cellular Biology

#### Mark Hurtig

Professor, Clinical Studies

#### Lorraine Jadeski

Assistant Professor, Human Health and Nutritional Sciences

#### Matthew S. Kimber

Associate Professor, Molecular and Cellular Biology

#### Cezar Khursigara

Associate Professor, Molecular and Cellular Biology

#### Stefan W. Kycia

Associate Professor, Physics

#### Vladimir Ladizhansky

Professor, Physics

#### Joseph Lam

Professor, Molecular and Cellular Biology

#### Anna T. Lawniczak

Professor, Mathematics and Statistics

#### Jacek Lipkowski

Professor, Chemistry

#### Alejandro Marangoni

Professor, Food Science

#### Mario Martinez Martinez

Assistant Professor, Engineering

#### A. Rodney Merrill

Professor, Molecular and Cellular Biology

#### Suresh Neethirajan

Assistant Professor, Engineering

#### Genevieve Newton

Assistant Professor, Human Health and Nutritional Sciences

#### Michele Oliver

Professor, Engineering

#### Joanne O'Meara

Professor, Physics

#### K. Peter Pauls

Professor, Plant Agriculture

#### Glen Pyle

Associate Professor, Biomedical Sciences

#### John Srbely

Assistant Professor, Human Health and Nutritional Sciences

#### Jeffrey J. Thomason

Professor, Biomedical Sciences

#### Lori A. Vallis

Associate Professor, Human Health and Nutritional Sciences

#### Robert Wickham

Associate Professor, Physics

#### Allan Willms

Associate Professor, Mathematics and Statistics

#### Janet M. Wood

Professor, Molecular and Cellular Biology

#### Simon Yang

Professor, Engineering

#### John Zettel

Assistant Professor, Human Health and Nutritional Sciences

### MSc Program

#### Admission Requirements

Students may be admitted to the MSc program in biophysics from a range of undergraduate programs, including physics, biology, biochemistry, microbiology, chemistry, mathematics, engineering, or computing science. To be considered for admission, applicants should meet the minimum requirements of a four-year honours degree with a 73% (B) average during the final two years of study. Applicants should briefly indicate their research interests and, if possible, their preferred advisors.

#### Degree Requirements

Students in the MSc program will be under the guidance of an interdepartmental advisory committee. A total of 1.5 credits are required, one of which is usually BIOP\*6000. In addition, all students are required to complete the seminar course BIOP\*6010. The advisory committee may require additional courses. An average of 70% (B-) or better must be obtained in the prescribed courses. Further information may be obtained from the chair of the group. When the course work is satisfactorily completed, the submission and successful defence of an appropriate thesis on an approved topic completes the requirements for the MSc in Biophysics.

### PhD Program

#### Admission Requirements

Applicants for the PhD program should have a recognized master's degree in an appropriate field, with a 77% (B+) average in their postgraduate studies. Applicants should briefly indicate their area of research interest and preferred advisor(s). It is often beneficial for applicants to talk with potential advisors before submitting an application.

Direct admission to the PhD program may be permitted for applicants holding a bachelor's degree with high academic standing. Students enrolled in the master's degree program who achieve a superior academic record and show a particular aptitude for research may be permitted to transfer to the PhD program. The application to transfer should be made to the chair of the biophysics program between the end of the second semester and the end of the fourth semester of work towards the master's degree.

## Degree Requirements

Students in the PhD program will be under the guidance of an interdepartmental advisory committee. For students who completed the MSc degree in a program other than Biophysics at the University of Guelph, a total of 1.0 graduate course credits are required, one of which is usually BIOP\*6000. For students who transfer directly into the PhD program from the MSc program in Biophysics, or who complete the MSc program in Biophysics at the University of Guelph, no additional course credits are required. In the case of students who enter the PhD program from the BSc degree, 1.5 graduate course credits are required, one of which is BIOP\*6000. In addition, all students are required to complete the non-credit seminar course, BIOP\*6010. The advisory committee may require additional courses for any student. An average of 70% (B-) or better must be obtained in the prescribed courses. As early as feasible, but no later than the final semester of the minimum duration, a PhD student is required to complete a qualifying examination to assess her or his knowledge of the subject. This examination should normally be taken within the first five semesters of registration as a PhD student. When the qualifying examination and the course work are satisfactorily completed, the submission and successful defense of an acceptable thesis on an approved topic completes the requirements for the PhD in Biophysics.

## Courses

### BIOP\*6000 Concepts in Biophysics W [0.50]

This course will emphasize basic concepts in molecular, cellular and structural biophysics arising from key journal publications and their impact on present day research trends.

*Department(s):* Dean's Office, College of Physical and Engineering Science

### BIOP\*6010 Biophysics Seminar U [0.00]

Public research seminar presented by all PhD students in the Biophysics program in yearly intervals after passing the qualifying exam. Students are required to attend all seminars presented during the semester in which they are registered for the course.

*Department(s):* Dean's Office, College of Physical and Engineering Science

### BIOP\*6100 Scientific Communication and Research Methods in Biophysics U [0.50]

The development and refinement of the skills of scientific communication, emphasizing oral presentation and writing skills, in the context of developing a literature review or thesis proposal. All Biophysics students will normally take this within 4 semesters of entering the program.

*Department(s):* Dean's Office, College of Physical and Engineering Science

### BIOP\*6950 Advanced Topics in Biophysics U [0.50]

This course provides opportunities for graduate students to study special topics in contemporary biophysical research under the guidance of graduate faculty members with pertinent expertise. Proposed course descriptions are considered by the Director of the Biophysics program on an ad hoc basis, and the course will be offered according to demand.

*Department(s):* Dean's Office, College of Physical and Engineering Science

### PHYS\*7510 Clinical Applications of Physics in Medicine U [0.50]

This course provides an overview of the application of physics to medicine. The physical concepts underlying the diagnosis and treatment of disease will be explored. Topics will include general imaging principles such as resolution, intensity, and contrast; x-ray imaging and computed tomography; radioisotopes and nuclear medicine, SPECT and PET; magnetic resonance imaging; ultrasound imaging and radiation therapy. Credit may be obtained for only one of PHYS\*4070 or PHYS\*7510.

*Department(s):* Department of Physics

### PHYS\*7520 Molecular Biophysics U [0.50]

Physical methods of determining macromolecular structure: energetics, intramolecular and intermolecular forces, with application to lamellar structures, information storage, DNA and RNA, recognition and rejection of foreign molecules. Offered in conjunction with PHYS\*4540. Extra work is required of graduate students.

*Restriction(s):* Credit may be obtained for only one of PHYS\*4540 or PHYS\*7520

*Department(s):* Department of Physics

### PHYS\*7540 Special Topics in Biophysics U [0.50]

Offered on demand

*Department(s):* Department of Physics

### PHYS\*7570 Special Topics in Biophysics U [0.25]

Offered on demand

*Department(s):* Department of Physics

With approval of the Advisory Committee a student can take courses offered by other departments in Life, Physical and Engineering Sciences. Example courses could be, but not limited to:

## Courses in Related Subjects:

### Biomedical Sciences

BIOM\*6110 [0.50] Research Methods in Biomedical Sciences

BIOM\*6160 [0.50] Cellular Biology

### Chemistry

CHEM\*7360 [0.50] Regulation in Biological Systems

CHEM\*7370 [0.50] Enzymes

CHEM\*7380 [0.50] Cell Membranes and Cell Surfaces

CHEM\*7310 [0.50] Selected Topics in Biochemistry

### Computing and Information Science

CIS\*6050 [0.50] Neural Networks

CIS\*6060 [0.50] Bioinformatics

CIS\*6080 [0.50] Genetic Algorithms

CIS\*6420 [0.50] Soft Computing

### Engineering

ENGG\*6070 [0.50] Medical Imaging

ENGG\*6130 [0.50] Physical Properties of Biomaterials

ENGG\*6150 [0.50] Bio-Instrumentation

ENGG\*6560 [0.50] Advanced Digital Signal Processing

### Human Health and Nutritional Sciences

HHNS\*6440 [0.50] Nutrition, Gene Expression and Cell Signalling

### Mathematics and Statistics

MATH\*6051 [0.50] Mathematical Modelling

MATH\*6071 [0.50] Biomathematics

STAT\*6761 [0.50] Survival Analysis

STAT\*6850 [0.50] Advanced Biometry

STAT\*6950 [0.50] Statistical Methods for the Life Sciences

### Molecular and Cellular Biology

MCB\*6310 [0.50] Advanced Topics in Molecular and Cellular Biology

MCB\*6370 [0.50] Protein Structural Biology and Bioinformatics

### Physics

PHYS\*7010 [0.50] Quantum Mechanics I \*

PHYS\*7020 [0.50] Quantum Mechanics II

PHYS\*7040 [0.50] Statistical Physics I\*

PHYS\*7050 [0.50] Statistical Physics II

## Biotechnology

The interdepartmental program focuses on molecular approaches and provides both scientific and business discipline-specific training. The Master of Biotechnology program provides graduates with advanced education, knowledge, technical and business expertise in the broad field of biotechnology. Courses promote effective communication of knowledge of the scientific discipline, as well as place it in a business context. It fosters academic and intellectual growth, as well as interactions between graduate students, faculty, the university, and the wider research community and the private sector. Students will be trained as highly competent, independent, and creative researchers/managers who are familiar with and able to integrate both the science and business environments. Furthermore, the program encourages the development of entrepreneurial activities in this area, which is crucial for the formation of new private sector companies. The ultimate goal of the program is to advance and encourage biotechnology research on campus, both amongst the graduate students enrolled in the program, as well as amongst and between faculty.

### Administrative Staff

#### Director

Steven Rothstein (4469 Summerlee Science Complex, Ext. 58524)  
rothstei@uoguelph.ca

#### Graduate Program Coordinator

Andrew Bendall (3459 Summerlee Science Complex, Ext. 53491)  
abendall@uoguelph.ca

#### Graduate Program Assistant

Carol Hannam (4451 Summerlee Science Complex, Ext. 56474)  
hannamc@uoguelph.ca

### Graduate Faculty

#### From the Department of Food, Agriculture and Resource Economics

##### Michael von Massow

BA Manitoba, BSc, MSc Guelph, PhD McMaster - Assistant Professor

#### From the Department of Integrative Biology

##### Robert Hanner

BSc Eastern Michigan, PhD Oregon - Associate Professor

##### Steven G. Newmaster

BSc Guelph, PhD Alberta - Associate Professor

#### From the Department of Molecular and Cellular Biology

##### Tariq Akhtar

BSc, MSc Waterloo, PhD Florida - Assistant Professor

##### Emma Allen-Vercoe

BSc London UK, PhD Open UK - Professor

##### Anthony J. Clarke

BSc, MSc, PhD Waterloo - Professor

##### Joseph L. Colasanti

BSc, PhD Western Ontario - Associate Professor

##### Marc Coppolino

BSc Waterloo, MSc, PhD Toronto - Associate Professor

##### John Dawson

BSc Wilfrid Laurier, PhD Alberta - Associate Professor

##### Michael J. Emes

BSc, PhD Sheffield - Professor

##### Steffen P. Graether

BSc, MSc, PhD Queen's - Associate Professor

##### George Harauz

BASc, MSc, PhD Toronto - Professor

##### Nina Jones

BSc Guelph, PhD Toronto - Associate Professor

##### David Josephy

BSc Toronto, PhD British Columbia - Professor

##### Azad Kaushik

BVSc, MVSc Haryana, DSc Inst. Pasteur - Associate Professor

##### Cezar Khursigara

BSc Ryerson, PhD McGill - Assistant Professor

##### Matthew S. Kimber

BSc, PhD Toronto - Associate Professor

##### Peter J. Krell

BSc, MSc Carleton, PhD Dalhousie - Professor

##### Joseph S.L. Lam

BSc, PhD Calgary - Professor

##### Ray Lu

BSc Wuhan (China), MSc Beijing Medical, PhD Saskatchewan - Associate Professor

##### Jaideep Mathur

BSc, MSc Lucknow (India), PhD Gorakhpur (India) - Associate Professor

##### Baozhong Meng

BSc, MSc Hebei Agricultural Univ. (China) - Associate Professor

##### Rod Merrill

BSc Lethbridge, PhD Ottawa - Professor

##### Richard D. Mosser

BSc, PhD Waterloo - Associate Professor

##### Robert T. Mullen

BSc, PhD Alberta - Professor

##### Lucy M. Mutharia

BSc, MSc Nairobi, PhD British Columbia - Associate Professor

##### Annette Nassuth

BSc, MSc Free University, Amsterdam, PhD Leiden - Associate Professor

##### Melissa Perreault

BSc, MSc, Ph.D, McMaster University - Assistant Professor

##### Steven Rothstein

BA Swarthmore College, PhD Wisconsin - Professor and Director, Biotechnology Program

##### Scott Ryan

BSc Memorial, PhD Ottawa - Assistant Professor

##### Stephen Y.K. Seah

BSc, MSc National University of Singapore, PhD Sheffield - Associate Professor

##### Ian Tetlow

BSc Newcastle (UK), PhD North Wales - Associate Professor

##### James Uniacke

BSc, PhD Concordia University - Assistant Professor

##### George van der Merwe

BSc, MSc, PhD Stellenbosch (South Africa) - Associate Professor

##### Terry Van Raay

BSc Windsor, MSc Guelph, PhD Utah - Assistant Professor

##### John Vessey

BSc, MSc Dalhousie, PhD Eberhard Karls University of Tübingen - Assistant Professor

##### Christopher Whitfield

BSc Newcastle, PhD Edinburgh - Professor

##### Krassimir (Joseph) Yankulov

BSc Sophia, PhD ICRF London - Associate Professor

#### From the Department of Management

##### Elliott Currie

BA, MBA McMaster, CMA - Associate Professor

##### Fred Pries

BMath Waterloo, MAsC, PhD Waterloo, CA - Associate Professor

##### Davar Rezanian

MSc Utrecht, MBA Derby, PhD Ramon LLULL, CMA - Associate Professor and Chair

##### Trent Tucker

BSc Alberta, MBA Toronto, PhD Waterloo - Assistant Professor

#### From the Department of Physics

##### John R. Dutcher

BSc Dalhousie, MSc British Columbia, PhD Simon Fraser - Professor

### MBIOT Program

#### Admission Requirements

Students entering the program will normally have completed an Honours Bachelor's degree with a minimum admission average of B (75% and higher) in one of the following fields: biology, molecular biology and genetics, biotechnology, microbiology, biochemistry, biophysics, food science, agriculture, food production systems, commerce with a strong science background. Anyone lacking the required background will be encouraged to complete them prior to commencing their studies in the new program (typically in the immediately preceding summer semester) or, if approved by the program counsellor, during their studies. Students whose first language is not English require a minimum TOEFL score of 93 with a minimum score of 22 in each of the four categories, or a minimum IELTS score of 7.0, with a minimum of at least 6.5 in each component. Applicants who have completed an undergraduate degree from institutions where the language of instruction was English may be exempt from ESL requirements, pending departmental approval.

All components of the application, including transcript(s), graduate certificate(s), grading scale(s), language test results and assessment forms must be uploaded no later than two months after an application is submitted through the OUAC portal. Applications that are incomplete after this time period will be closed.

## Admissions Process

Graduate student applications to programs in the College of Biological Science are handled by the Office of the Associate Dean, Research (ADR). Before submitting an application, applicants are strongly encouraged to view the "Before you Apply" and "Admission Process" webpages on the ADR Future Student's site.

Space in this program will be limited and students are advised to apply as early as possible to be accepted for the following Fall. Application details are posted on the program web-site.

## Degree Requirements

A total of 4.0 course credits are required to graduate, which must include BIOT\*6500, BIOT\*6600, BIOT\*6550, BIOT\*6610 and BIOT\*6700 (each 0.50). In addition, the research project course BIOT\*6800 (1.00) must be taken in Semester 3. Additional courses can be selected from electives.

An optional Semester 4 may be added, as a research project extension.

## Duration of the Program

Students will normally take three courses per semester for two semesters (3.0 credits) and complete the Biotechnology Masters project (1.0) credit in semester 3. Therefore, the program normally takes 12 months of full-time study. There is, however, the option to continue the Biotechnology Masters project into a second fall semester, in which case the program will take 16 months of full-time study.

## Courses

### Core Courses

<b>BIOT*6500 Molecular Biotechnology F [0.50]</b>
This course will provide an overview of molecular approaches relevant to a broad range of biotechnology industries including those found in medical, microbial, protein, pharmaceutical, environmental and agricultural fields.
<i>Department(s):</i> Department of Molecular and Cellular Biology
<b>BIOT*6550 Biodiversity and Biotechnology W [0.50]</b>
Biological diversity includes the variability among living organisms spanning genetic, species, habitat and geographic scales, thereby encompassing all living things and associated systems. This course will provide an overview of DNA-based approaches used to analyze and characterize the main principles of biodiversity followed by discussions of the impact of biologically diverse communities within the biotechnology sector.
<i>Department(s):</i> Department of Molecular and Cellular Biology
<b>BIOT*6600 Innovation Management F [0.50]</b>
This course will focus on the integration of science and business from initial discovery through to commercialization. This integration involves resolving issues related to technical, market and financial feasibility. Topics will include the innovation process, assessment of markets, development of business models and managing projects under high uncertainty.
<i>Department(s):</i> Department of Management
<b>BIOT*6610 Cases in Biotechnology Management W [0.50]</b>
This course will examine contemporary issues in biotechnology / science-based business through a case-based approach. Topics from across the spectrum of business disciplines (marketing, management, strategy, intellectual property, etc.) will be examined. Time permitting, a live case with an industry partner will be used.
<i>Prerequisite(s):</i> BIOT*6600
<i>Department(s):</i> Department of Management
<b>BIOT*6700 Communication in Science and Business W [0.50]</b>
The goal of this course is to develop written, and oral presentation skills to effectively communicate ideas and experiments in both scientific and business contexts. Students will be asked to write and orally communicate a research proposal.
<i>Department(s):</i> Department of Molecular and Cellular Biology
<b>BIOT*6800 Research Project S [1.00]</b>
The students will be matched with a research advisor in their first semester and write a research proposal on their project in the second semester communication course. During the time they do their research project, they will be expected to do the research work that they propose and then to prepare a written report of their results and conclusions as well as to give a poster presentation on this. The research project can be undertaken with any appropriate faculty member, or with an approved off-campus institution.
<i>Restriction(s):</i> Students registered in Master of Biotechnology program
<i>Department(s):</i> Department of Molecular and Cellular Biology

## Electives

### College of Biological Sciences

MCB*6310	[0.50]	Advanced Topics in Molecular and Cellular Biology
MCB*6370	[0.50]	Protein Structural Biology and Bioinformatics
HHNS*6440	[0.50]	Nutrition, Gene Expression and Cell Signalling

## Bioinformatics

BINF*6110	[0.50]	Genomic Methods for Bioinformatics
BINF*6210	[0.50]	Software Tools for Biological Data Analysis and Organization

## College of Business and Economics

UNIV*6050	[1.00]	The Integration of Science and Business in Agrifood Systems
MGMT*6100	[0.50]	Evidence Based Management Research
MGMT*6200	[0.50]	Leadership Assessment and Development
MGMT*6300	[0.50]	Business Consulting
MGMT*6400	[0.50]	Project Management

## Ontario Agricultural College

ANSC*6450	[0.50]	Topics in Animal Biotechnology
ENVS*6040	[0.50]	Molecular Basis of Plant-Microbe Interactions
PLNT*6500	[0.50]	Applied Bioinformatics

## Business Administration

The MBA program is based on the application of contemporary management concepts and strategies to industries where the University of Guelph has distinctive capabilities. Upon admission, participants choose an industry focus for their program. The three fields available to students are:

- Hospitality and Tourism Management
- Food and Agribusiness Management
- Sustainable Commerce

### Administrative Staff

If you have any enquiry pertaining to the MBA Program at the University of Guelph, please contact:

#### Assistant Dean and Executive Director, Executive Programs

Charles Evans (800B MacKinnon Bldg., Ext. 53433)  
chevans@uoguelph.ca

#### Manager, Executive Programs

Catherine Statton (800 MacKinnon Bldg, Ext. 56607)  
cstatton@uoguelph.ca

#### Joe Barth

Graduate Program Coordinator

### Graduate Faculty

The MBA program is administered and managed by the College of Business and Economics (CBE), through the Executive Programs Office. The MBA currently has three fields; 1) Food and Agribusiness Management and 2) Hospitality and Tourism Management and 3) Sustainable Commerce which are offered in partnership with academic units: the Department of Food, Agricultural and Resource Economics (in the Ontario Agricultural College), the Department of Management (in CBE), the School of Hospitality, Food and Tourism Management (in CBE), the Department of Economics and Finance (in CBE) and the Department of Marketing and Consumer Studies (in CBE).

### From the Department of Food, Agricultural and Resource Economics (OAC):

#### Andreas Boecker

MSc, PhD Kiel - Associate Professor

#### John A.L. Cranfield

BSc, MSc Guelph, PhD Purdue - Professor

#### Brady J. Deaton

BS Missouri, MS Virginia Tech, PhD Michigan State - Associate Professor

#### Glenn C. Fox

BSc(Agr), MSc Guelph, PhD Minnesota - Professor

#### Getu Hailu

BSc, MSc Alemaya, PhD Alberta - Associate Professor

#### Spencer Henson

BSc, PhD Reading - Professor

#### Mark Holmes

BComm, MSA Ryerson, PhD York - Assistant Professor

#### Kalinga Jagoda

BSc Moratuwa, PhD Western Sydney - Assistant Professor

#### Rakhal C. Sarker

BSc, MSc Bangladesh, PhD Guelph - Associate Professor

#### Richard Vyn

BSc Dordt College, MSc Alberta, PhD Guelph - Assistant Professor

#### Alfons J. Weersink

BSc Guelph, MSc Montana State, PhD Cornell - Professor

### From the Department of Management (CBE):

#### Ron Baker

BComm Sudbury, MBA Athabasca, PhD Birmingham UK, CPA, CMA - Associate Professor

#### Michele Bowring

BA Queen's, MBA York, PhD Leicester - Assistant Professor

#### Francesco Braga

DOTT Milan, PhD Guelph - Associate Professor

#### Nita Chhinzer

BA York, MBA, PhD McMaster - Associate Professor

#### Julia Christensen Hughes

BComm Guelph, MBA, PhD York - Professor and Dean, College of Business and Economics

#### Elliott Currie

BA, MBA McMaster, CPA, CMA - Associate Professor

#### Rumina Dhalla

MBA, PhD York - Associate Professor

#### Jamie A. Gruman

BA Concordia, MA Lakehead, PhD Windsor - Associate Professor

#### Louise Hayes

BSc, MBA British Columbia, PhD Waterloo, CA - Assistant Professor

#### Kalinga Jagoda

BSc Moratuwa, PhD Western Sydney, CPA, CMA - Assistant Professor

#### Elizabeth Kurucz

BA McMaster, MIR Toronto, PhD York - Associate Professor

#### Philippe Lassou

MBA Senegal, MSc, PhD Birmingham - Assistant Professor

#### Jing Lu

BEng Shanghai, MBA Sungkyunkwan, PhD Calgary - Assistant Professor

#### Sean Lyons

BPA Windsor, MA, PhD Ottawa - Associate Professor

#### Sara Mann

BComm MBA McMaster, PhD Toronto - Associate Professor

#### Fred Pries

BMATH Waterloo, MSc, PhD Waterloo, CPA, CA - Associate Professor

#### Davar Rezanian

MSc Utrecht, MBA Derby, PhD Ramon LLULL, CPA, CMA - Associate Professor and Chair

#### Sandra Scott

BSc Toronto, MBA, McMaster, CPA, CA, CFA - Assistant Professor

#### Trent Tucker

BSc Alberta, MBA Toronto, PhD Waterloo - Assistant Professor

#### John Walsh

BA Thames Polytechnic, MBA, PhD Western Ontario - Professor

#### Agnes Zdaniuk

BA Waterloo, MSc, PhD Waterloo - Assistant Professor

### From the School of Hospitality, Food and Tourism Management (CBE):

#### Joe Barth

BSc Guelph, MBA Wilfrid Laurier, MPS, PhD Cornell - Associate Professor and Interim Director

#### Hwan-Suk (Chris) Choi

BA Chung-Ang (Seoul, Korea), MTA George Washington, PhD Texas A&M - Associate Professor

#### Statia Elliot

BComm St. Mary's, MA McMaster, PhD Carleton - Assistant Professor

#### Joan Flaherty

BA, MA, MSc, Guelph - Assistant Professor

#### Kerry Godfrey

BSc Victoria, MSc Surrey, PhD Oxford Brookes, MBA Leicester - Associate Dean and Associate Professor

#### Marion Joppe

BA Waterloo, MA, PhD Univ. d'Aix-Marseille III (France) - Professor and Research Chair

#### Tanya MacLaurin

BSc, MSc, PhD Kansas State - Associate Professor

#### Bruce McAdams

BComm, MA Guelph - Assistant Professor

#### Erna van Duren

BA Waterloo, MSc, PhD Guelph - Professor

#### Michael von Massow

BA Manitoba, BSc, MSc Guelph, PhD McMaster - Assistant Professor

### From the Department of Economics and Finance (CBE)

#### Francis Tapon

MBA Columbia, MA, PhD Duke - Professor

#### Ilias Tsiakas

BA, MA York, PhD Toronto - Associate Professor

### From the Department of Marketing and Consumer Studies:

#### May H. Aung

BComm, MComm Burma, PhD York - Associate Professor

#### Sylvain Charlebois

BComm, MBA, DBA (Marketing) Sherbrooke - Professor

#### Vinay Kanetkar

BArch, MArch, MSc, PhD UBC - Associate Professor

#### Brent McKenzie

BA, Diploma in Business Administration, MBA, PhD Griffith University - Associate Professor

## MBA Program

The MBA program is offered in three broad fields: 1) hospitality and tourism management; 2) food and agribusiness management; 3) sustainable commerce and involves a core group of courses that build and develop key managerial skills, courses that allow students to apply concepts and skills to management situations in their chosen industry, and course work is followed by industry-related research culminating in a major project. Case studies are widely used. Program prerequisites include relevant experience in the participant's chosen industry.

### Admission Requirements

A four-year undergraduate degree or its equivalent (from a recognized university) with an average of at least a B-(70-72%) in the last two years of study and:

1. At least three years of industry related experience including supervisory and managerial responsibility **OR**
2. A mandatory GMAT for applicants who do not have the relevant three years work experience.

Alternate admission may be offered to applicants with a three year General degree, diploma and/or an acceptable professional designation AND having completed at least five years of relevant work experience.

### Degree Requirements

#### MBA Online

The University of Guelph Master of Business Administration (Online) program operates on a full cost recovery basis delivering a highly successful distance learning program that is a combination of electronic coursework and three residential periods.

The MBA program offers fields in Hospitality and Tourism Management, Food and Agribusiness Management and Sustainable Commerce and requires completion of twelve courses and a major research project or fourteen courses

Online courses are offered as 8-week modules that require approximately 20 hours of study per week. With internet service you can study anywhere, anytime with the flexibility that enables you to balance family, career and study priorities.

The three residential components are held in Guelph, Ontario, Canada.

#### Core Courses

Participants complete nine core courses, which provide a foundation for graduate management education. These courses build and develop key managerial skills applicable in the private and public sectors of the economy. The core program is specifically geared to today's manager- leader, team player, decision maker and coach:

BUS*6050	[0.50]	Management Communications
BUS*6110	[0.50]	Foundations of Leadership
BUS*6140	[0.50]	Foundations of Human Resource Management
BUS*6150	[0.50]	Research Methods for Managers
BUS*6180	[0.50]	Financial and Managerial Accounting
BUS*6200	[0.50]	Financial Management
BUS*6600	[0.50]	Sustainable Value Creation
BUS*6700	[0.50]	Strategic Management & Business Game
BUS*6790	[0.50]	Operations Management

#### Fields

##### Food and Agribusiness Management

The Food and Agribusiness Management field is designed to prepare graduates for advanced careers in the food, agribusiness and production agriculture sectors.

Working with faculty from CBE participants complete three advanced courses related to the food and agribusiness sector:

BUS*6100	[0.50]	Food and Agribusiness Economics and Policy
BUS*6120	[0.50]	Food and Agribusiness Marketing
BUS*6520	[0.50]	Managing Price Risk

In addition, the program allows participants to choose to complete the requirements for the MBA degree by additional two elective courses or by the completion of a major research project BUS\*6900.

##### Hospitality and Tourism Management

The Hospitality and Tourism Management field is designed to prepare graduates for advanced careers in the accommodation, food service and tourism industries.

Working with faculty from the School of Hospitality, Food and Tourism Management, participants complete three advanced courses related to the hospitality and tourism sector:

BUS*6510	[0.50]	Hospitality and Tourism Revenue Management
BUS*6320	[0.50]	Hospitality and Tourism Marketing
BUS*6550	[0.50]	Managing Service Quality

In addition, the program allows participants to choose to complete the requirements for the MBA degree by two additional courses or by the completion of a major research project BUS\*6900.

##### Sustainable Commerce

The Sustainable Commerce field is designed to prepare graduates for advanced careers in which sustainability is a key business objective

Working with faculty of CBE and the Department of Geography, participants complete three advanced courses related to sustainable commerce sector:

BUS*6300	[0.50]	Business Practices for Sustainability
BUS*6500	[0.50]	Governance for Sustainability
BUS*6850	[0.50]	Marketing Strategy

In addition, the program allows participants to choose to complete the requirements for the MBA degree by two additional courses for the course work option or by the completion of a major research project BUS\*6900.

### Major Research Project

The major research project is comprised of developing a research proposal, researching an applied management problem and requires data collection, analysis and the ability to link understanding of the problem with an appropriate body of literature.

### Program Time Commitment and Duration

Participants normally complete the Online MBA within two years. Courses are completed in sequence and are typically two months in length. Students are expected to devote 20 to 25 study hours per week to participate in the program.

### MBA On Campus

#### Note

Please note that this program is not accepting applicants at this time.

The MBA on-campus program is designed for people who wish to complete the MBA in one intensive year of study.

The MBA on campus program also requires completion of twelve courses and a major research project or the program may be completed entirely by coursework by completing fourteen courses.

The courses are completed on campus at the University of Guelph. Participants complete required coursework in three consecutive semesters beginning annually in May finishing with the capstone course the following May.

### Computer Systems Requirements

#### On-Line MBA: Equipment Requirements

MBA Online participants are required to have Microsoft Office software and adequate peripherals to support the learning system, which must include DVD capability and a sound card. A basic level of computer literacy is strongly recommended for the MBA program. High speed internet access is required.

Online MBA participants are solely responsible to arrange for purchase/maintenance of recommended computer systems and software, and should have a contingency plan in the event of system failure. Participants may be required to upgrade minimum hardware/software based on rapidly changing industry standards and continuous development of state-of-the-art learning tools.

For information pertaining to the computer requirements contact our program administrative staff or visit our MBA web site: <http://www.mba.uoguelph.ca/>

### Courses

<b>BUS*6050 Management Communications U [0.50]</b>
Examination of the theory, function and practice of managerial communications with particular emphasis on developing communication strategies and skills.
<i>Restriction(s):</i> CBE Executive Programs students only
<i>Department(s):</i> Executive Programs
<b>BUS*6100 Food and Agribusiness Economics and Policy U [0.50]</b>
An analysis of economic and policy issues relevant for food and agribusiness managers in affluent economies, with emphasis on the economic and policy environment that exists within North America.
<i>Restriction(s):</i> CBE Executive Programs students only
<i>Department(s):</i> Executive Programs
<b>BUS*6110 Foundations of Leadership U [0.50]</b>
The course will enhance participants' interpersonal competency, as well as their knowledge and understanding of the theory and research underlying the impact of team management and collaboration on the organization.
<i>Restriction(s):</i> CBE Executive Programs students only
<i>Department(s):</i> Executive Programs
<b>BUS*6120 Food and Agribusiness Marketing U [0.50]</b>
A study of marketing decision-making in food and agribusiness firms, with emphasis on the formulation of strategic marketing plans.
<i>Restriction(s):</i> CBE Executive Programs students only
<i>Department(s):</i> Executive Programs

**BUS\*6140 Foundations of Human Resource Management U [0.50]**

This course examines the essential human resource management functions of planning, staffing, employee development, compensation, health and safety, labour relations, and legal compliance, in a variety of organizational settings.

*Restriction(s):* CBE Executive Programs students only

*Department(s):* Executive Programs

**BUS\*6150 Research Methods for Managers U [0.50]**

Students learn to formulate a research problem, undertake a literature review, and to select and use appropriate quantitative and qualitative techniques for the collection and analysis of relevant data. The course also promotes the use of the World Wide Web as an information resource.

*Restriction(s):* CBE Executive Programs students only

*Department(s):* Executive Programs

**BUS\*6180 Financial and Managerial Accounting U [0.50]**

This course emphasizes the gathering and use of financial information to facilitate effective financial and management decisions. Cases are used to approach the subject from the perspective of the user of accounting information rather than that of the supplier.

*Department(s):* Executive Programs

**BUS\*6200 Financial Management U [0.50]**

This course takes the viewpoint of the senior financial officer of a commercial enterprise. The focus is on the management of cash, accounts receivable, inventories and capital assets, as well as on the sourcing of funds through short-term liabilities, long-term debt and owners' equity.

*Prerequisite(s):* BUS\*6180

*Restriction(s):* Non MBA students only by permission of instructor.

*Department(s):* Executive Programs

**BUS\*6220 Special Topics in Management Issues U [0.50]**

An advanced course for those specializing in management, marketing or organizational behaviour. Deals with current and future topics, trends and problems in the industry, strategic planning, and the integration of management, marketing, and organizational behaviour.

*Restriction(s):* CBE Executive Programs students only

*Department(s):* Executive Programs

**BUS\*6230 Special Topics in Business U [0.50]**

Advanced course for those specializing in organizational behaviour. Deals with in-depth analysis of industry organizational behaviour, management of current and future problems, reorganizations, corporate cultures, multi-cultural organizations, and ethics.

*Restriction(s):* CBE Executive Programs students only

*Department(s):* Executive Programs

**BUS\*6300 Business Practices for Sustainability U [0.50]**

This course focuses on critical strategic and managerial issues related to sustainability and introduces students to concepts linking organizational strategies and sustainability principles. It explores how managers can integrate consideration of the environment and society into business strategies and business practices to improve competitive advantage and create environmental, social and economic value.

*Department(s):* Executive Programs

**BUS\*6320 Hospitality and Tourism Marketing U [0.50]**

Analysis and application of marketing foundations through integration of marketing variables with real-world situations and in-depth analysis of strategic marketing issues.

*Restriction(s):* CBE Executive Programs students only

*Department(s):* Executive Programs

**BUS\*6400 Canadian Business Law: Addressing Legal Issues in Organizations F,W [0.50]**

This course will introduce you to Canadian business law and give you an understanding of legal principals as they apply to business organizations. After reviewing basic foundational concepts and sources of law in Canada, we will undertake a more in-depth review of practical legal issues and solutions that arise in various business environments. Topics include contracts, torts, employment law, class action and conflict resolution.

*Restriction(s):* Executive Program students only

*Department(s):* Executive Programs

**BUS\*6450 Global Business Today U [0.50]**

This course will survey the key issues related to doing business internationally including the cultural context for global business, cross border trade and investment, ethics, the global monetary system, foreign exchange challenges and effectively competing in the global environment.

*Restriction(s):* Non MBA/MA Leadership students only by permission of Executive Programs Office.

*Department(s):* Executive Programs

**BUS\*6500 Governance for Sustainability U [0.50]**

This course introduces MBA students to the rise of environmentalism and state-led environmental management, and the evolving world of environmental governance. Coupled with this review is coverage of some key contemporary environmental issues of relevance to business executives such as climate change and fisheries decline.

*Restriction(s):* Executive Program students only

*Department(s):* Executive Programs

**BUS\*6510 Hospitality and Tourism Revenue Management U [0.50]**

This course discusses revenue maximization strategies and tactics that improve the profitability of businesses that work in fixed capacity environments, face time-varied demand, their product is homogeneous and their cost structure reflects a high proportion of fixed and a low proportion of variable cost items.

*Prerequisite(s):* HTM\*6300

*Restriction(s):* CBE Executive Programs students only

*Department(s):* Executive Programs

**BUS\*6520 Managing Price Risk U [0.50]**

The course deals with the use of futures, options and other instruments for marketing, risk management and investment purposes. Emphasis is placed on the development and implementation of trading strategies and on the policy and corporate governance framework necessary to support effective management.

*Restriction(s):* CBE Executive Programs students only

*Department(s):* Executive Programs

**BUS\*6550 Managing Service Quality U [0.50]**

A holistic and interdisciplinary approach is used to explore the principles of service management. The course will enhance participants' understanding of what actually constitutes quality, the nature of service, and strategies for improving it.

*Restriction(s):* CBE Executive Programs students only

*Department(s):* Executive Programs

**BUS\*6590 Organizational Theory and Design U [0.50]**

Core concepts in organizational theory and their interrelationships as well as concepts such as group decision making and intragroup and intergroup dynamics are explored.

*Restriction(s):* CBE Executive Programs students only

*Department(s):* Executive Programs

**BUS\*6600 Sustainable Value Creation S [0.50]**

Many organizations have redefined their business strategies in line with principles of sustainability in order to maximize value creation for the organization and its stakeholders. In this course students will critically examine these sustainability drivers and strategic approaches to value creation.

*Restriction(s):* Executive Program students only

*Department(s):* Executive Programs

**BUS\*6700 Strategic Management & Business Game U [0.50]**

An integrative course which draws together the conceptual theories and models of the graduate program core. Utilizes conceptual, analytical, problem identification, and problem solving skills.

*Restriction(s):* CBE Executive Programs students only

*Department(s):* Executive Programs

**BUS\*6790 Operations Management U [0.50]**

This course applies operations research theory and practices to management problem solving and decision-making. The focus is on modelling service and product delivery systems and major emphasis is placed on managerial problems in hospitality, tourism, and food and agribusiness organizations.

*Restriction(s):* CBE Executive Programs students only

*Department(s):* Executive Programs

**BUS\*6800 Readings in Leadership I U [0.50]**

This course is available to individuals or groups of graduate students. Students will complete a set of readings and an associated paper as approved by designated faculty. Specific learning objectives consistent with the University's will be developed each time the course is offered.

*Department(s):* Executive Programs

**BUS\*6810 Readings in Leadership II U [0.50]**

This course is available to individuals or groups of graduate students. Students will complete a set of readings and an associated paper as approved by designated faculty. Specific learning objectives consistent with the University's will be developed each time the course is offered.

*Prerequisite(s):* BUS\*6800 (or may be taken concurrently)

*Department(s):* Department of Management

**BUS\*6820 Readings in Management U [0.50]**

This course is available to individuals or groups of graduate students. Students will complete a set of readings and an associated paper as approved by designated faculty. Specific learning objectives consistent with the University's will be developed each time the course is offered.

*Department(s):* Department of Management

**BUS\*6850 Marketing Strategy U [0.50]**

An advanced course for those specializing in marketing. Deals with marketing theories, models, and specific subsets of marketing such as pricing, consumer and industrial-buyer behaviour, distribution, services, and service-delivery concepts.

*Restriction(s):* CBE Executive Programs students only

*Department(s):* Department of Management

**BUS\*6900 Major Research Project U [1.00]**

A detailed critical review of an area of study specific to the specialization of students in the MBA by course work and major paper option.

*Restriction(s):* CBE Executive Programs students only

*Department(s):* Department of Management

## Capacity Development and Extension

The Capacity Development and Extension Program offers a thesis or major paper course of study leading to the MSc degree. Subject areas including community engagement, adult learning and development, communication, leadership, decision-making, facilitation as well as capacity building at individual, organizational and systems levels. Our MSc graduates work in Canada and around the world in the operations and management of training, innovation and knowledge systems, community development and organizational change.

### Administrative Staff

#### Director

Sean Kelly (104 Landscape Architecture, Ext. 56870)  
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#### Graduate Program Coordinator

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### Graduate Faculty

#### Nicholas Brunet

BSc McGill, MSc Guelph, PhD McGill - Assistant Professor

#### Helen Hambly Odame

BA Toronto, ME.S., PhD York - Associate Professor

#### Allan C. Lauzon

BA, MSc Guelph, EdD Toronto - Professor

#### James P. Mahone (retiring August 31, 2017)

BSc U.S. Coast Guard Academy (Connecticut), PhD Michigan State - Associate Professor

### Associated Graduate Faculty

#### Laxmi Pant

HBSc. Tribhuvan Univeristy (Nepal), MSc Norwegian Univ of Life Sciences, PhD – University of Guelph

### MSc Program

Capacity Development and Extension offers a professionally oriented program leading to the MSc degree in capacity development and extension. The program covers a broad range of topics including capacity development, interpersonal communication, facilitation and leadership, media and communication technologies, adult learning and innovation processes. A variety of learning formats are offered by the program including community engaged learning, independent study, distance education, seminars, international courses and research colloquia.

Graduate students focus on Capacity Development and Extension. The Program offers core courses and restricted electives. Other courses of interest are available in other academic units including Rural Planning and Development, and the Departments of Food, Agricultural and Resource Economics, Geography, History and Sociology and Anthropology.

### Admission Requirements

The program is open to qualified graduates from a wide variety of disciplines including agriculture, education, international development, sociology, communication, cultural studies, health, political science, history, and economics. A four-year honours degree is considered as the normal and basic admission requirement. Work or volunteer experience in a rural area or community level is considered especially useful in applying theory to practice and in identifying research needs and topics.

Students in Capacity Development and Extension have employment opportunities in areas such as rural and volunteer organizations, community development, non-formal education, family and consumer studies, social work, communication technology, agricultural extension and applied research, health, international development project management and program analysis, and technology transfer.

### Degree Requirements

Students enrol in one of two study options: 1) course work and major paper, or 2) thesis. A minimum of two full-time semesters of course work, or equivalent, must be completed. The MSc program requirements provide a foundation for capacity development and extension research and practice.

#### Course Work and Major Research Paper (MRP)

Students must complete three (3) core courses, a minimum of four (4) restricted electives, one (1) open elective and the major paper.

The core course consist of:

CDE*6070	[0.50]	Foundations of Capacity Building and Extension
CDE*6260	[0.50]	Research Design
EDRD*6000	[0.50]	Qualitative Analysis in Rural Development
OR		

RPD*6380	[0.50]	Application of Quantitative Techniques in Rural Planning and Development
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AND

CDE*6900	[1.00]	Major Research Paper
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#### Thesis

Students must complete three (3) core courses, a minimum of two (2) restricted electives, one (1) open elective and a thesis.

The core courses consist of:

CDE*6070	[0.50]	Foundations of Capacity Building and Extension
CDE*6260	[0.50]	Research Design
EDRD*6000	[0.50]	Qualitative Analysis in Rural Development

OR

RPD*6380	[0.50]	Application of Quantitative Techniques in Rural Planning and Development
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Students select an advisor and a research committee who will assist them in course selection, research and thesis development.

### Collaborative Specializations

#### International Development Studies

Capacity Development and Extension participates in the International Development Studies (IDS) collaborative specialization. Students take a minimum of 2.5 course credits in the school and a minimum of 2.5 credits in international development studies. The MSc degree for students in this collaborative specialization will have the specialist designation rural extension studies: international development studies. Please consult the International Development Studies listing for a detailed description of the collaborative specialization including the special additional requirements for each of the participating departments.

### Courses

#### Core Courses

CDE*6070 Foundations of Capacity Building and Extension U [0.50]		
Contemporary issues and changes in rural communities and the implications for building community capacity. Students will be introduced to and examine dominant paradigms of community capacity building for meeting rural needs.		
<i>Department(s):</i> School of Environmental Design and Rural Development		
CDE*6260 Research Design U [0.50]		
Provides students with abilities and knowledge to undertake, formulate and implement research in their chosen area of development. Students are expected to acquire the ability to identify research question and the appropriate designs to answer such questions.		
<i>Department(s):</i> School of Environmental Design and Rural Development		
CDE*6900 Major Research Paper U [1.00]		
Students select a topic and write a paper that does not necessarily include original data but is an analysis and synthesis of materials dealing with the topic selected.		
<i>Restriction(s):</i> Instructor consent required.		
<i>Department(s):</i> School of Environmental Design and Rural Development		
EDRD*6000	[0.50]	Qualitative Analysis in Rural Development
OR		
RPD*6380	[0.50]	Application of Quantitative Techniques in Rural Planning and Development
Restricted Elective Courses		
CDE*6290 Special Topics in Capacity Building and Extension U [0.50]		
Selected study topics which may be pursued in accordance with the special needs of students in the program.		
<i>Department(s):</i> School of Environmental Design and Rural Development		
CDE*6311 Community Engagement and Public Participation U [0.50]		
This course will explore the philosophy and principles of public participation. An emphasis will be placed on those practices and methods that can be used to engage communities and organizations within a participatory framework.		
<i>Department(s):</i> School of Environmental Design and Rural Development		
CDE*6320 Capacity Building for Sustainable Development U [0.50]		
Learning processes enhancing human capital in civil society and the organizational and managerial capabilities that can empower communities to meet their economic, social, cultural and environmental needs. Examines development and underdevelopment and the role of non-formal education and administration in facilitation social change in peripheral regions from an interdisciplinary perspective.		
<i>Department(s):</i> School of Environmental Design and Rural Development		

**CDE\*6330 Facilitation and Conflict Management U [0.50]**

Explore the theories of leadership, practice leadership skills and activities, and develop an understanding of the role facilitation and conflict management play in organizational success. Emphasizes personal individual development through practice, lecture and group discussion. Service learning through facilitation of community meetings will be part of the course.

*Restriction(s):* Instructor consent required.

*Department(s):* School of Environmental Design and Rural Development

**CDE\*6410 Readings in Capacity Building and Extension U [0.50]**

A program of supervised independent study related to the student's area of concentration.

*Restriction(s):* Instructor consent required.

*Department(s):* School of Environmental Design and Rural Development

**CDE\*6420 Communication for Social and Environmental Change U [0.50]**

Communication process for social change and development including participatory media. Students engage in community-based work involving multi-media projects. Course covers the history of development communication and current praxis in Canada and internationally.

*Restriction(s):* Instructor consent required.

*Department(s):* School of Environmental Design and Rural Development

**CDE\*6690 Community Environmental Leadership U [0.50]**

This course explores the relationships between the environment and socio-economic issues at the community level and the resulting conflict. Using the social change model, this course examines the linkages between advocacy, decision-making and conflict and the development of strategies to mitigate community conflict.

*Restriction(s):* Instructor consent required.

*Department(s):* School of Environmental Design and Rural Development

## Chemistry

The Guelph-Waterloo Centre for Graduate Work in Chemistry and Biochemistry combines the Department of Chemistry at the University of Waterloo and the Department of Chemistry at the University of Guelph into a comprehensive and all-inclusive school of graduate chemistry and biochemistry. The members of the centre conduct research in virtually all areas of modern chemistry and biochemistry.

Professional personnel in the centre comprise those faculty members of the two departments who have been appointed as PhD advisors and have a record of recent research achievement. The centre is administered by the director and its affairs are guided by the co-ordinating committee, which consists of the director, the two departmental chairs, the two departmental Graduate Program Coordinators, two elected centre members from each campus, and one elected representative of the graduate student body from each campus. The regulations applying to graduate study in the centre meet the requirements of the graduate councils and the Senates of the two universities.

The fields of research in which theses can be written normally fall within the categories of:

- Analytical chemistry
- Inorganic chemistry
- Nanoscience
- Organic chemistry
- Theoretical chemistry
- Polymer chemistry
- Biological chemistry or Biochemistry
- Physical Chemistry

The category chosen will normally be referred to as the candidate's major. However, if a suitable topic is chosen, a candidate may pursue research which involves more than one of the categories listed above. Certain course requirements must be fulfilled both for the MSc and for the PhD. These courses are chosen in consultation with the candidate's advisory committee and the graduate officers of the centre.

### Administrative Staff

#### Director of the Centre

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#### Administrative Assistant for the Centre

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#### Chair of the Department at Guelph

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#### Departmental Graduate Program Assistant

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### Graduate Faculty

#### France-Isabelle Auzanneau

Maitrise, DEA, PhD Paris XI-Orsay - Professor

#### Michael K. Denk

Dipl. Ludwig-Maximilians, PhD Munich - Associate Professor

#### Wojciech Gabryelski

BSc, MSc Technical University of Gdansk (Poland), PhD Alberta - Assistant Professor

#### Abdelaziz Houmam

Maitrise Casablanca I, DEA, PhD Paris 7 - Associate Professor

#### Lori Jones

BSc New Brunswick, PhD Guelph - Associate Professor

#### Jacek Lipkowski

MSc, PhD, DSc Warsaw - Professor

#### Richard A. Manderville

BSc, PhD Queen's - Professor

#### Mario A. Monteiro

BSc, PhD York University - Professor

#### Glenn H. Penner

BSc, MSc, PhD Manitoba - Associate Professor

#### Kathryn E. Preuss

BSc Lethbridge, PhD Waterloo - Professor and Tier II Canada Research Chair

#### Paul A. Rowntree

BSc, MSc Waterloo, PhD, MA Princeton - Professor, Director of the Electrochemical Centre

#### Marcel Schlaf

Diplom Bayerische Julius-Maximilian Universitat, PhD Toronto - Professor and Graduate Program Coordinator

#### Adrian L. Schwan

BSc Western Ontario, PhD McMaster - Professor and Chair

#### Dmitriy V. Soldatov

MSc Novosibirsk State, PhD Russian Academy of Sciences - Associate Professor

#### W.W.L. Tam

BSc Hong Kong, PhD Toronto - Professor

#### Daniel F. Thomas

BSc Alberta, PhD Toronto - Associate Professor

#### Peter Tremaine

BSc Waterloo, PhD Alberta - Professor

### Graduate Faculty from University of Waterloo

#### Marc Aucoin

BSc, MSc (Waterloo), PhD (Montreal) - Assistant Professor

#### Monica Barra

BSc, PhD National Univ. of Cordoba (Argentina) - Associate Professor

#### Jonathan Baugh

BSc Tennessee (Chattanooga), PhD North Carolina (Chapel Hill) - Assistant Professor

#### Pu Chen

BSc, MSc Nanjing, MSc, PhD Toronto, - Professor

#### J. Michael Chong

BSc, PhD British Columbia - Professor

#### David Cory

BA, PhD (Case Western Reserve) - Professor and Canada Excellence Research Chair

#### Thorsten Dieckmann

Dipl., Dr. rer. nat. Braunschweig - Associate Professor

#### Gary I. Dmitrienko

BSc, PhD Toronto - Associate Professor

#### Jean Duhamel

BEng, MSc, PhD (ENSIC, Nancy, France) - Professor and Canda Research Chair

#### Eric Fillion

BSc Sherbrooke, MSc Montreal, PhD Toronto - Professor

#### Marianna Foldvari

BSc, DPharmSci Semmelweis Medical University, Budapest, Hungary - Professor

#### Mario Gauthier

BSc, PhD McGill - Professor

#### Tadeusz Gorecki

MSc, PhD (Technical University of Gdansk) - Professor

#### Bruce M. Greenberg

BSc California (Berkeley), PhD Colorado (Boulder) - Professor

#### J. Guy Guillemette

BSc, PhD Toronto - Associate Professor and Graduate Officer

#### John F. Honek

BSc, PhD McGill - Professor and Chair

#### Scott Hopkins

BSc, PhD New Brunswick - Assistant Professor

#### Jamie W. Joseph

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#### Vassili Karanassios

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#### Mikko Karttunen

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#### Holger Kleinke

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#### Sonny C. Lee

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#### Robert J. LeRoy

BSc, MSc Toronto, PhD Wisconsin - University Professor

#### K. Tong Leung

BSc, PhD British Columbia - Professor

#### Jeuwen Liu

BS Science and Technology (China), PhD Illinois (Urbana-Champaign) - Assistant Professor

#### Vivek Maheshwari

BTech Delhi, MSc Wayne State, PhD Virginia - Assistant Professor

#### Terrance B. McMahon

BSc Alberta, PhD California Institute of Technology - University Professor and Dean of Science

#### Elizabeth M. Meiering

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**Susan R. Mikkelsen**

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**Graham K. Murphy**

BSc (CVictoria), PhD (Alberta) - Assistant Professor

**Linda F. Nazar**

BSc British Columbia, PhD Toronto - Professor and Canada Research Chair

**Marcel Nooijen**

BSc, PhD Vrije Universiteit van Amsterdam - Associate Professor

**Richard T. Oakley**

BSc, MSc, PhD British Columbia - Professor

**Michael Palmer**

MD Giessen - Associate Professor

**Janusz Pawliszyn**

BSc, MSc Gdansk (Poland), PhD Southern Illinois - Professor and University/NSERC Industrial Research Chair and Canada Research Chair

**Alexander Penlidis**

DiplEng Thessaloniki, PhD McMaster - Professor

**William P. Power**

BSc, PhD Dalhousie - Associate Professor

**Eric Prouzet**

MSc, PhD Nantes - Associate Professor

**Pavle Radovanovic**

MS Georgetown, PhD Washington - Assistant Professor and Canada Research Chair

**Derek Schipper**

BSc University of P.E.I, PhD University of Ottawa - Assistant Professor

**German Sciaini**

BSc, PhD University of Buenos Aires - Associate Professor

**Leonardo Simon**

BChE, MChE, PhD Federal Univ. of Rio Grande do Sul (Brazil) - Associate Professor

**Xiao-Wu (Shirley) Tang**

BS Huazhong University of Science and Technology, PhD Massachusetts Institute of Technology - Assistant Professor

**Scott Taylor**

BSc McGill, MSc, PhD Toronto - Professor

**Xiaosong Wang**

BSc, MSc Zhejiang University, PhD East China University of Science & Technology - Associate Professor

**Shawn Wettig**

BSc Lethbridge, PhD Saskatchewan - Assistant Professor

## MSc Program

The fields of research in which theses can be written normally fall within: 1) analytical; 2) inorganic; 3) nanoscience; 4) organic; 5) theoretical (also chemical physics); 6) polymer chemistry; 7) biological chemistry or biochemistry and 8) Physical Chemistry.

An applicant is encouraged to apply for admission if he/she has an honours bachelor of science degree, or the equivalent, with a minimum standing of 75% in the last two years from an accredited university. The co-op MSc option is not available to students who have completed a co-op program as undergraduates. These students are, however, eligible for admission to the co-op PhD program.

Applicants whose first language is not English are required to submit evidence of proficiency in the English language or pass the Test of English as a Foreign Language (TOEFL).

## Degree Requirements

Students enrol in one of three study options: 1) thesis, 2) co-op, or 3) part-time course work and major research project.

### Thesis

Students must successfully complete at least four semester-long graduate courses, one of which is MSc Seminar, CHEM\*7940, and submit and defend an acceptable thesis.

### Co-op

The academic requirements are the same as in the regular MSc program, but at least two of the required four semester-long courses (including CHEM\*7940) must be completed during the first two semesters of study. COOP\*1100 - Introduction to Co-operative Education, a mandatory, non-credit course, is a prerequisite for the first work term and prepares the student for the employment process. This course must be completed the semester prior to the competitive co-op job search semester.

The co-operative education requirements are to successfully complete two consecutive 4-month co-op work terms in an approved laboratory. The student's performance in the workplace is supervised and evaluated by the student's employer using the Work Performance Evaluation tool. The student's progress during the work term is also monitored by Co-operative Education & Career Services, including an official site visit during the co-op work term and a review of the student's official Learning Goals. A Co-op Work Term Report is required for each work term and is graded by an assigned Co-op Faculty Advisor. All evaluation grades will appear on the student's official transcript.

An altered co-op fee payment schedule will be proposed during the admission offer stage.

After returning to campus, the student will complete his/her course work and research and prepare the MSc thesis.

## Part-Time Course Work and Major Research Project (MRP)

Students who elect this option must successfully complete eight semester-long courses, including MSc Seminar, CHEM\*7940, and MSc Research Project, CHEM\*7970. This option is designed for students whose employment or family responsibilities allow free time for study only in the evenings.

## PhD Program

The fields of research in which theses can be written normally fall within: 1) analytical; 2) inorganic; 3) nanoscience; 4) organic; 5) theoretical (also chemical physics); 6) polymer chemistry; (delete and) 7) biological chemistry or biochemistry; and 8) physical chemistry.

An applicant is eligible for admission to the PhD program at the discretion of the director. In general, an applicant must possess the qualifications listed for the MSc program, together with a master of science degree comparable to those awarded by North American universities and suitable references from the institution at which the MSc degree was awarded. However, direct admission to the PhD program is available to applicants with an overall A standing in an Honours BSc degree.

Applicants whose first language is not English are required to submit evidence of proficiency in the English language or pass the Test of English as a Foreign Language (TOEFL).

## Degree Requirements

### PhD Program

Students in the PhD program must successfully complete three semester-long courses beyond those required for the master of science degree. One of these courses will be PhD Seminar, CHEM\*7950. Students must also pass an oral qualifying examination in their major field, and submit and defend an acceptable thesis.

Students admitted directly to the PhD program from a BSc must successfully complete one semester-long course beyond those required for the master of science degree. In addition, students must also complete CHEM\*7950 (PhD Seminar), pass an oral qualifying examination in their major field, and submit and defend an acceptable thesis.

### PhD Co-operative Option

Students registered in the PhD program may proceed to that degree under the co-operative option. Under this option one of the two required one-term courses, in addition to CHEM\*7950 and qualifying, must be completed within the first two academic semesters of study in the centre. COOP\*1100 - Introduction to Co-operative Education, a mandatory, non-credit course, is a prerequisite for the first work term and prepares the student for the employment process. This course must be completed the semester prior to the competitive co-op job search semester.

After successful completion of the academic semesters of course work, the co-operative education requirements are to successfully complete three consecutive 4-month co-op work terms in an approved laboratory. The student's performance in the workplace is supervised and evaluated by the student's employer using the Work Performance Evaluation tool. The student's progress during the work term is also monitored by Co-operative Education & Career Services, including an official site visit during the co-op work term and a review of the student's official Learning Goals. A Co-op Work Term Report is required for each work term and is graded by an assigned Co-op Faculty Advisor. All evaluation grades will appear on the student's official transcript.

An altered co-op fee payment schedule will be proposed during the admission offer stage.

Following successful completion of the work year, the student will return to the centre to continue work on a PhD research project and complete the regular PhD requirements.

## Collaborative Specializations

### Toxicology

The Department of Chemistry participates in the MSc/PhD collaborative specialization in toxicology. Please consult the Toxicology listing for a detailed description of the MSc/PhD collaborative specialization. Students choosing this option must meet the requirements of the toxicology collaborative specialization, as well as those of (GWC)2 for their particular degree program. Three toxicology courses must be completed including Advanced Topics in Toxicology, TOX\*6200, and a research project must be conducted with a participating faculty member at the University of Guelph.

## Courses

Except where specified, courses in the following list may be offered in any semester subject to student demand and the availability of an instructor.

All courses are given an eight character code with the sixth having the following significance: 1 (inorganic), 2 (analytical), 3 (biochemistry), 4 (theoretical), 5 (physical), 6 (organic), and 7 (polymer).

## Inorganic

<b>CHEM*7100 Selected Topics in Inorganic Chemistry U [0.50]</b>
Discussion of specialized topics related to the research interests of members of the centre. Special topics could include, for example: bioinorganic chemistry; inorganic reaction mechanisms; synthetic methods in inorganic and organometallic chemistry; homogeneous and heterogeneous catalysis; chemistry of polynuclear compounds. <i>Department(s):</i> Department of Chemistry
<b>CHEM*7120 X-ray Crystallography U [0.50]</b>
Introduction: crystals, basic concepts; space groups: the reciprocal lattice; x-ray diffraction; the phase problem; structure factors; electron density; small molecule structure solution, structure refinement, structure results, journals and databases, paper writing. <i>Department(s):</i> Department of Chemistry
<b>CHEM*7130 Chemistry of Inorganic Solid State Materials U [0.50]</b>
Introduction to solid state chemistry, common crystal structures, principles of solid state synthesis, theory and experimental methods for characterizing solids, including thermal analysis techniques, powder x-ray and neutron diffraction methods; special topics to include one or more of the optical, electronic, magnetic, or conductive properties of inorganic materials. Prerequisites: one semester-long undergraduate course (at least third-year level) in inorganic chemistry, preferably with content in structural and/or solid state. <i>Department(s):</i> Department of Chemistry
<b>CHEM*7150 Structure and Bonding in Inorganic Chemistry U [0.50]</b>
Free electron, Hückel and extended Hückel methods for molecules and clusters. Perturbation theory. Applications of group theory in inorganic chemistry; Jahn-Teller effects in molecules and solids. Energy bands in one, two and three dimensions. Prerequisites: three semester-long undergraduate courses in inorganic chemistry and one semester-long undergraduate course in quantum mechanics or group theory. <i>Department(s):</i> Department of Chemistry
<b>CHEM*7170 Advanced Transition Metal Chemistry U [0.50]</b>
Magnetochemistry of transition metal compounds. Electronic spectra of complex ions including applications of molecular orbital and ligand field theories. Stabilization of unusual oxidation states and co-ordination numbers. Bonding, structure and reactivity of certain important classes of metal complexes, e.g., metal hydrides, metal-metal bonded species, biologically significant model systems such as macrocycles. <i>Department(s):</i> Department of Chemistry
<b>CHEM*7180 Advanced Organometallic Chemistry U [0.50]</b>
Reactions, structure and bonding of organometallic compounds of transition and non-transition metals. <i>Department(s):</i> Department of Chemistry

## Analytical

<b>CHEM*7200 Selected Topics in Analytical Chemistry U [0.50]</b>
Special topics could include, for example: trace analysis using modern instrumental and spectroscopic methods; advanced mass spectrometry (instrumentation and interpretation of spectra); analytical aspects of gas and liquid chromatography. <i>Department(s):</i> Department of Chemistry
<b>CHEM*7240 Chemical Instrumentation U [0.50]</b>
Instrumental components and optimum application; rudiments of design; electrical, spectral, migrational and other methods. <i>Department(s):</i> Department of Chemistry
<b>CHEM*7260 Topics in Analytical Spectroscopy U [0.50]</b>
Atomic emission and absorption spectroscopy; methods of excitation and detection; quantitative applications. Molecular electronic spectroscopy, UV, visible and Raman; instrumental characteristics; applications to quantitative determinations, speciation, measurements of equilibrium, etc. Sources and control of errors and interferences. Determination and description of colour. <i>Department(s):</i> Department of Chemistry
<b>CHEM*7270 Separations U [0.50]</b>
Material to be covered is drawn from the following topics: diffusion; isolation of organic material from the matrix; chromatographic techniques - principles of chromatographic separation, gas (GLC, GSC), liquid (LLC, LSC, GPC, IEC), supercritical fluid (SFC) chromatographies; GC-MS, CG-FTIR; electrophoresis, flow field fractionation. Prerequisites: undergraduate level course in instrumental analysis. <i>Department(s):</i> Department of Chemistry

<b>CHEM*7280 Electroanalytical Chemistry U [0.50]</b>
A study of electroanalytical techniques and their role in modern analytical chemistry. The underlying principles are developed. Techniques include chronamperometry, chronocoulometry, polarography, voltammetry, chronopotentiometry, coulometric titrations, flow techniques, electrochemical sensors and chemically modified electrodes. <i>Department(s):</i> Department of Chemistry
<b>CHEM*7290 Surface Analysis U [0.50]</b>
<i>Department(s):</i> Department of Chemistry

## Biochemistry

<b>CHEM*7300 Proteins and Nucleic Acids U [0.50]</b>
Determination of protein sequence and 3-dimensional structure, protein anatomy; prediction of protein structure; intermolecular interactions and protein-protein association; effects of mutation. Nucleic acid structure and anatomy; DNA and chromatin structure; RNA structure; snRNPs and ribozymes; protein-nucleic acid interactions. <i>Department(s):</i> Department of Chemistry
<b>CHEM*7310 Selected Topics in Biochemistry U [0.50]</b>
Discussion of specialized topics related to the research interests of members of the centre: for example, recent offerings have included peptide and protein chemistry, biochemical toxicology, medical aspects of biochemistry, glycolipids and glycoproteins, redox enzymes, biological applications of magnetic resonance, etc. <i>Department(s):</i> Department of Chemistry
<b>CHEM*7360 Regulation in Biological Systems U [0.50]</b>
Mechanisms of regulation of metabolism - enzyme clusters; phosphorylation and protein kinases/phosphatases, repression and induction, protein turnover. Regulation of transcription, translation and mRNA processing. Cell cycle and control of cell division. <i>Department(s):</i> Department of Chemistry
<b>CHEM*7370 Enzymes U [0.50]</b>
Mechanisms of rate enhancement. Enzyme kinetics - steady state; inhibitors; bisubstrate enzymes; fast reaction kinetics. Enzyme reaction mechanisms. Structural and genetic modification of enzymes. Catalytic antibodies. Binding processes. Multiple sites and co-operativity. Allosteric enzymes and metabolic control. Catalysis by RNA. <i>Department(s):</i> Department of Chemistry
<b>CHEM*7380 Cell Membranes and Cell Surfaces U [0.50]</b>
Membrane proteins and lipids - structure and function; dynamics; techniques for their study; model membrane systems. Membrane transport. The cytoskeleton. Membrane protein biogenesis, sorting and targeting. Signal transduction across membranes. The cell surface in immune responses. <i>Department(s):</i> Department of Chemistry

## Physical/Theoretical

<b>CHEM*7400 Selected Topics in Theoretical Chemistry U [0.50]</b>
Discussion of specialized topics related to the research interests of the members of the centre. Special topics could include for example: theory of intermolecular forces; density matrices; configuration interaction; correlation energies of open and closed shell systems; kinetic theory and gas transport properties; theory of the chemical bond. <i>Department(s):</i> Department of Chemistry
<b>CHEM*7450 Statistical Mechanics U [0.50]</b>
Review of classical and quantum mechanics; principles of statistical mechanics; applications to systems of interacting molecules; imperfect gases, liquids, solids, surfaces and solutions. <i>Department(s):</i> Department of Chemistry
<b>CHEM*7460 Quantum Chemistry U [0.50]</b>
Approximate solutions of the Schrodinger equation and calculations of atomic and molecular properties. <i>Department(s):</i> Department of Chemistry
<b>CHEM*7500 Selected Topics in Physical Chemistry U [0.50]</b>
Discussion of specialized topics related to the research interests of the members of the centre. Special topics could include for example: principles of magnetic resonance in biological systems; collisions, spectroscopy and intermolecular forces, surface chemistry; catalysis; electrolyte theory; non-electrolyte solution theory, thermodynamics of biological systems; thermodynamics. <i>Department(s):</i> Department of Chemistry
<b>CHEM*7550 Kinetics - Dynamics U [0.50]</b>
Empirical analysis. Kinetic theory of gases. Potential energy surfaces. Unimolecular rates. Relaxation and steady state methods. Diffusion rates. Rates between polar molecules. Energy transfer. <i>Department(s):</i> Department of Chemistry

**CHEM\*7560 Spectroscopy U [0.50]**

Aspects of electronic vibrational and rotational spectroscopy of atoms, molecules, and the solid state. Relevant aspects of quantum mechanics, Dirac notation, and angular momentum will be discussed. Group Theory will be presented and its implications for spectroscopy introduced. Prerequisites: one semester-long undergraduate course in quantum mechanics or the approval of the instructor.

*Department(s):* Department of Chemistry

**Organic****CHEM\*7600 Selected Topics in Organic Chemistry U [0.50]**

Two or three topics from a range including: bio-organic chemistry; environmental organic chemistry; free radicals; heterocyclic molecules; molecular rearrangements; organometallic chemistry; photochemistry; natural products.

*Department(s):* Department of Chemistry

**CHEM\*7640 Synthetic Organic Reactions U [0.50]**

Named organic reactions and other synthetically useful reactions are discussed. The mechanism, stereochemical implications and use in organic synthesis of these reactions will be presented. Examples from the organic literature will be used to illustrate these aspects.

*Department(s):* Department of Chemistry

**CHEM\*7650 Strategies in Organic Synthesis U [0.50]**

The synthesis of organic compounds is discussed and emphasis is placed on the design of synthetic routes. Examples drawn from the literature are used to illustrate this synthetic planning.

*Prerequisite(s):* CHEM\*7640

*Department(s):* Department of Chemistry

**CHEM\*7660 Organic Spectroscopy U [0.50]**

Ultraviolet, infrared, resonance spectroscopy and mass spectrometry, with emphasis on applications to studies of organic molecules.

*Department(s):* Department of Chemistry

**CHEM\*7690 Physical Organic Chemistry U [0.50]**

Linear free energy relationships; substituent effects and reactive intermediates.

*Department(s):* Department of Chemistry

**Polymer****CHEM\*7700 Principles of Polymer Science U [0.50]**

Introduction to the physical chemistry of high polymers, principles of polymer synthesis, mechanisms and kinetics of polymerization reactions, copolymerization theory, polymerization in homogeneous and heterogeneous systems, chemical reactions of polymers. Theory and experimental methods for the molecular characterization of polymers.

*Department(s):* Department of Chemistry

**CHEM\*7710 Physical Properties of Polymers U [0.50]**

The physical properties of polymers are considered in depth from a molecular viewpoint. Rubber elasticity, mechanical properties, rheology and solution behaviour are quantitatively treated.

*Prerequisite(s):* CHEM\*7700 or equivalent

*Department(s):* Department of Chemistry

**CHEM\*7720 Polymerization and Polymer Reactions U [0.50]**

The reactions leading to the production of polymers are considered with emphasis on emulsion and suspension polymerization and polymerization reaction engineering. Polymer degradation, stabilization and modification reactions are also considered in depth.

*Prerequisite(s):* CHEM\*7700 or equivalent.

*Department(s):* Department of Chemistry

**CHEM\*7730 Selected Topics in Polymer Chemistry U [0.50]**

Discussion of specialized topics of polymer chemistry related to the research interests of the faculty or prominent scientific visitors. Special topics could include, for example: polymer stabilization and degradation; mechanical properties; polymer principles in surface coatings; organic chemistry of synthetic high polymers; estimation of polymer properties; reactions of polymers; polymerization kinetics.

*Department(s):* Department of Chemistry

**Research****CHEM\*7940 MSc Seminar U [0.50]**

A written literature review and research proposal on the research topic will be presented and defended in a 30-minute public seminar. This requirement is to be completed by all thesis-option MSc students within two semesters of entering the program.

*Department(s):* Department of Chemistry

**CHEM\*7950 PhD Seminar U [0.00]**

*Department(s):* Department of Chemistry

**CHEM\*7970 MSc Research Paper U [0.50]**

An experimental project normally based on the CHEM\*7940 research proposal, supervised by the advisor, taking three to four months to complete. This project may be completed at any time during the student's program, but it must follow CHEM\*7940. A written report is required, and a seminar based on the content of the report will be presented. The report must be completed as per the project/thesis guidelines of the University campus on which the student is registered. This course normally will follow the course CHEM\*7940 MSc Seminar.

*Department(s):* Department of Chemistry

**CHEM\*7980 MSc Thesis U [0.00]**

*Department(s):* Department of Chemistry

**CHEM\*7990 PhD Thesis U [0.00]**

*Department(s):* Department of Chemistry

## Clinical Studies

The Department of Clinical Studies offers graduate programs leading to MSc and DVSc degrees and the graduate diploma.

### Administrative Staff

#### Chair

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### Graduate Faculty

#### Anthony C.G. Abrams-Ogg

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#### Luis Arroyo

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#### Shane Bateman

DVM, DVSc, DVSc, Dipl. ACVECC - Associate Professor

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#### Sauna Blois

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#### Nicola Cribb

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#### Alice Defarges

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#### Sonja Fonfara

DVM, Dr med vet, PhD, CertVC, Dipl. ECVIM - Associate Professor

#### Thomas Gibson

BSc Guelph, BEdu Windsor, DVM, DVSc Guelph, Dipl. ACVS - Associate Professor and Graduate Program Coordinator

#### Joanne Hewson

DVM, PhD Guelph, Dipl. DACVIM (LA) - Associate Professor

#### Mark M. Hurtig

DVM Guelph, MVSc Saskatchewan, Dipl. ACVS - Professor

#### Fiona James

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#### Carolyn L. Kerr

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#### Noel Moens

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#### Anthony Mutsaers

DVM Guelph, PhD Toronto, Dipl. ACVIM - Assistant Professor

#### Stephanie Nykamp

DVM, MSc Western, Dipl. ACVR - Associate Professor & Associate Dean, Clinical Program

#### Michelle Oblak

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#### Lynne O'Sullivan

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#### Henry Staempfli

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#### Elizabeth A. Stone

BA Scripps College, DVM California (Davis), MS Georgia, MPP Duke - Professor

#### Donald Trout

BS, DVM Washington State, PhD California, Dipl. ACVS - Associate Professor

#### Alexander Valverde

DVM Nacional (Costa Rica), DVSc Guelph, Dipl. ACVAA - Associate Professor

#### Adronie Verbrugghe

BSc, DVM, PhD Ghent, Dipl. ECVN - Assistant Professor

#### J. Paul Woods

DVM Guelph, MS Wisconsin, Dipl. ACVIM (Internal Medicine, Oncology) - Professor

### Associated Graduate Faculty

#### Luis Gaitero

DVM, Diplomate ECVN - Associate Professor, Contractually Limited Faculty, Clinical Studies, University of Guelph

### MSc Program

#### Admission Requirements

Candidates must have either an honours baccalaureate degree or a DVM degree; licensure to practice veterinary medicine in Ontario is not required.

#### Degree Requirements

Students enrol in one of two study options: 1) thesis, or 2) course work and major research paper.

#### Thesis

The thesis option provides focused research training in areas related to veterinary medicine. Research projects may examine aspects of clinical practice or concepts but are not considered discipline or specialty training. Candidates are accepted based on adequate background preparation and availability of an advisor in the area of interest. Applicants should contact potential faculty advisors with established research programs listed in the [department website](#)

Positions are generally not funded by the researcher. Qualified applicants need to provide their own living expenses and tuition funds, or obtain a scholarship or sponsorship by an organization.

We do not offer a clinical Master of Science program.

The program involves a minimum of 3 courses, a research project and writing of a thesis. Candidates are required to carry out an independent experimental study and produce a thesis. Three graduate level courses are required.

#### Course Work and Major Research Project (MRP)

The course work plus major project option will comprise a minimum of 4.5 credits, including six 0.5-credit graduate courses and a mandatory 1.0 credit, 2-semester major project course. The major project course will be supervised by the student's advisory committee, and will consist of a literature review, participation in a clinical research project or retrospective study, preparation of a manuscript suitable for publication in a peer-reviewed scientific journal, and presentation in a Departmental seminar. A mark will be assigned by the advisory committee, based on the manuscript and oral presentation.

There will be no required courses beyond the 1.0 credit project course. The remaining courses will be chosen from courses currently provided by the Department of Clinical Studies and other Ontario Veterinary College Departments, and will be tailored to the student's particular research interests. It is anticipated that most courses will be taken from within the Department. Undergraduate courses will not normally be eligible for credit toward this program. Course selection will be made by the student in consultation with the advisory committee, and will be approved by the departmental Graduate Studies and Research Committee. This option will normally require a minimum of 3 semesters of full-time study.

### DVSc Program

The DVSc degree is offered in large animal surgery, small animal surgery, large animal medicine, small animal medicine, anaesthesiology, cardiology, neurology, ophthalmology, dermatology and radiology, depending upon availability. The program provides advanced academic preparation in both clinical training and research and is a unique post-professional doctoral-level degree. The DVSc differs from PhD training by emphasizing the development of both research and applied skills in the various areas of clinical specialization appropriate for preparation for specialty Board certification.

Doctor of Veterinary Science positions are usually funded positions, and are usually advertised and selected through the American Association of Veterinary Clinicians' website at [www.virmp.org](http://www.virmp.org) which can be accessed in early October. Completed applications are due to us by December 1st each year, announcements made in early March and the start date is mid-July. Occasionally specialty training positions become available and are advertised on our website, as well as in the Canadian Veterinary Journal. This program involves one-third of the time taking a minimum of 5 graduate courses, conducting a research project and writing a thesis on the research, and two-thirds of the time in applied clinical practice. Applicants must be eligible to be licensed by the College of Veterinarians of Ontario.

The DVSc is currently an interdepartmental program and receives input from all academic departments in the Ontario Veterinary College (OVC): Biomedical Sciences, Clinical Studies, Pathobiology and Population Medicine.

### Admission Requirements

A doctor of veterinary medicine (DVM) or equivalent which would allow the applicant to be eligible for licensure to practice veterinary medicine in Ontario. In addition a completed internship or equivalent is usually required.

### Degree Requirements

Candidates are required to develop investigative skills in their chosen area of specialization by carrying out an original study, generally related to animal health. The results of the research must make a significant contribution to the candidate's area of specialization and be written up as a thesis. Five graduate level courses are required.

### Graduate Diploma Program

The diploma program in clinical studies was introduced to provide appropriate postgraduate discipline training for veterinarians who wish to improve their expertise in a specific area. It entails a full-time three-semester program for candidates who are veterinarians with limited time for graduate study but who desire to upgrade their knowledge and skills. The program requires the completion of formal graduate courses and extensive participation in the care of animals admitted to the Veterinary Teaching Hospital.

Clinical instruction is done using a service team concept, wherein a graduate diploma student interacts with DVSc students and faculty advisors. It is expected that graduates will return to private practice with enhanced clinical skills, or progress into MSc or internship programs.

Candidates are accepted based on adequate background preparation and availability of an advisor in the area of interest. Applicants should contact potential faculty advisors listed in the department website. This program is not intended to upgrade general knowledge to North American standards nor is this program intended to prepare foreign graduates for national board exams.

### Admission Requirements

Admission to a postgraduate diploma program as a regular student may be granted, on recommendation of the department, to the holder of a recognized DVM degree (or equivalent) with at least 'B-' standing during the final two years of study.

### Diploma Requirements

The student is assigned an advisor who is responsible for the planning and regular review of the program of the candidate. A thesis is not required. Both undergraduate and graduate courses may be taken and, when appropriate for the student, a review manuscript suitable for publication in a refereed scientific journal is prepared. For some students, a heavier course load is substituted for the manuscript requirement.

### Collaborative Specializations

Faculty in Clinical Studies also participate in the collaborative specialization in Neuroscience.

### Courses

#### Medicine

##### CLIN\*6010 Clinical Medicine F [0.50]

These are in-service clinical training courses based on case material presented to the student in the Veterinary Teaching Hospital. Under supervision, the student is expected to take primary responsibility for case management including decisions related to diagnosis, therapy and client/referring veterinarian communications. Case material studied in each course reflects a different clinical subspecialty commonly occurring in the Fall (F), Winter (W), and Summer (S) semesters respectively.

*Department(s):* Department of Clinical Studies

##### CLIN\*6030 Clinical Medicine W [0.50]

These are in-service clinical training courses based on case material presented to the student in the Veterinary Teaching Hospital. Under supervision, the student is expected to take primary responsibility for case management including decisions related to diagnosis, therapy and client/referring veterinarian communications. Case material studied in each course reflects a different clinical subspecialty commonly occurring in the Fall (F), Winter (W), and Summer (S) semesters respectively.

*Department(s):* Department of Clinical Studies

##### CLIN\*6031 Clinical Medicine S [0.50]

These are in-service clinical training courses based on case material presented to the student in the Veterinary Teaching Hospital. Under supervision, the student is expected to take primary responsibility for case management including decisions related to diagnosis, therapy and client/referring veterinarian communications. Case material studied in each course reflects a different clinical subspecialty commonly occurring in the Fall (F), Winter (W), and Summer (S) semesters respectively.

*Department(s):* Department of Clinical Studies

##### CLIN\*6190 Neurology F [0.50]

Basic principles of lesion localization in the domestic species with discussions of diagnostic problems in veterinary neurology. Offered alternate years.

*Restriction(s):* Instructor consent required.

*Department(s):* Department of Clinical Studies

##### CLIN\*6200 Concepts and Application of Infection Control U [0.50]

This course will involve principles of infection control in veterinary hospitals, drawing heavily from information from human medicine and evaluating human information in a veterinary context.

*Department(s):* Department of Clinical Studies

##### CLIN\*6380 Electrocardiography in Domestic Animals F,W,S [0.50]

This course will deal with the study of the electrocardiography of the cat, dog, cow and horse. Students will review the mechanisms of arrhythmogenesis and the role of anti-arrhythmic agents in the control of arrhythmogenesis.

*Department(s):* Department of Clinical Studies

##### CLIN\*6550 Small Animal Internal Medicine I F [0.50]

This is a graduate course designed for DVSc students and residents pursuing further study in the area. The basis of the course is the acquisition and application of knowledge of the pathophysiologic mechanisms of disease. Subject areas to be addressed may include: cardiovascular disease, respiratory disease and acid-base-electrolyte abnormalities.

*Department(s):* Department of Clinical Studies

##### CLIN\*6560 Small Animal Internal Medicine II W [0.50]

A continuation of Small Animal Internal Medicine I. Subject areas to be addressed may include: endocrine diseases, pharmacodynamics, renal disease and neurologic disease.

*Department(s):* Department of Clinical Studies

##### CLIN\*6570 Large Animal Internal Medicine I W [0.50]

Advanced study in general medicine and pathophysiologic principles of disorders of the gastrointestinal and urinary systems in ruminants, swine and horses. Offered every third year.

*Department(s):* Department of Clinical Studies

##### CLIN\*6580 Large Animal Internal Medicine II W [0.50]

Advanced study in general medicine and the pathophysiologic principles of disorders of the cardiovascular, respiratory and musculo-skeletal systems of ruminants and horses. Offered every third year.

*Department(s):* Department of Clinical Studies

##### CLIN\*6590 Large Animal Internal Medicine III W [0.50]

Advanced study in general medicine and the pathophysiologic principles of neonatal disorders and disorders of the nervous system, skin and general systemic disorders. Offered every third year.

*Department(s):* Department of Clinical Studies

##### CLIN\*6661 Respiratory Physiology & Pathophysiology U [0.50]

This is a graduate course designed for veterinarians pursuing advanced training in residency and DVSc programs. The course will cover normal respiratory anatomy, physiology and pulmonary function. A focus on respiratory pathophysiology will include respiratory failure, oxygen therapy and positive pressure ventilation. (offered every three years).

*Department(s):* Department of Clinical Studies

##### CLIN\*6670 Structure & Function of Animal Skin F,W,S [0.50]

A review of structure and function of skin in veterinary dermatology including the epidermis, dermis, subcutis and adnexal tissue. Application of knowledge in a clinical setting will follow with attention to modalities that will improve the epidermal barrier

*Restriction(s):* Instructor consent required.

*Department(s):* Department of Clinical Studies

##### CLIN\*6680 Readings in Cardiology I F,W,S [0.50]

Original articles, review articles and textbook chapters dealing with the most recent concepts of pathophysiology, diagnostic procedures and therapeutic advancements will be reviewed, analyzed and discussed.

*Department(s):* Department of Clinical Studies

##### CLIN\*6690 Readings in Cardiology II F,W,S [0.50]

Readings in Cardiology II will be a continuation of the format of Readings in Cardiology I with further readings in clinical cardiology.

*Department(s):* Department of Clinical Studies

**CLIN\*6960 Special Topics: Zoological Med F,W [0.50]**

Preparation for the ACZM examination and based on the published ACZM examination reading list. Students will prepare reading assignments that will be discussed during scheduled time. Each semester will focus on a specific taxon group. A mock examination will be provided on an ACZM sub-specialty (typically birds, reptiles, wildlife, terrestrial mammals or aquatic medicine).

*Restriction(s):* Instructor consent required.

*Department(s):* Department of Clinical Studies

**Surgery****CLIN\*6170 Clinical Surgery F [0.50]**

These are in-service clinical training courses based on case material presented to the student in the Veterinary Teaching Hospital. Under supervision, the student is expected to take primary responsibility for case management including decisions related to diagnosis, therapy and client/referring veterinarian communications. Case material studied in each course reflects a different clinical subspecialty occurring in Fall (F), Winter (W), and Summer (S) semesters respectively. The student is required to prepare a paper for publication in a recognized peer review journal based on clinical case material presented to the teaching hospital. As an alternative, the paper can be an in-depth review article on a clinically relevant topic.

*Department(s):* Department of Clinical Studies

**CLIN\*6180 Clinical Surgery W [0.50]**

These are in-service clinical training courses based on case material presented to the student in the Veterinary Teaching Hospital. Under supervision, the student is expected to take primary responsibility for case management including decisions related to diagnosis, therapy and client/referring veterinarian communications. Case material studied in each course reflects a different clinical subspecialty occurring in Fall (F), Winter (W), and Summer (S) semesters respectively. The student is required to prepare a paper for publication in a recognized peer review journal based on clinical case material presented to the teaching hospital. As an alternative, the paper can be an in-depth review article on a clinically relevant topic.

*Department(s):* Department of Clinical Studies

**CLIN\*6181 Clinical Surgery S [0.50]**

These are in-service clinical training courses based on case material presented to the student in the Veterinary Teaching Hospital. Under supervision, the student is expected to take primary responsibility for case management including decisions related to diagnosis, therapy and client/referring veterinarian communications. Case material studied in each course reflects a different clinical subspecialty occurring in Fall (F), Winter (W), and Summer (S) semesters respectively. The student is required to prepare a paper for publication in a recognized peer review journal based on clinical case material presented to the teaching hospital. As an alternative, the paper can be an in-depth review article on a clinically relevant topic.

*Department(s):* Department of Clinical Studies

**CLIN\*6270 Applied Surgical Principles U [0.25]**

General surgical principles associated with surgical and related treatment of various body systems. This is an applied course with laboratory and written components. Prerequisite: must have prior surgical training.

*Department(s):* Department of Clinical Studies

**CLIN\*6310 Advanced Equine Veterinary Orthopaedics U [0.50]**

This course will provide the student with an in-depth understanding of orthopaedic practice and will facilitate revision of materials to prepare board certification.

*Prerequisite(s):* DVM or BSc

*Department(s):* Department of Clinical Studies

**CLIN\*6600 Equine Soft Tissue Surgery I F,W,S [0.50]**

Based on required reference reading, every other week discussion will cover advanced soft tissue procedures performed in equine surgery. Guest lectures on selected topics will be presented. Laboratory will be given.

*Department(s):* Department of Clinical Studies

**CLIN\*6610 Equine Soft Tissue Surgery II F,W,S [0.50]**

Based on required reference reading, every other week discussion will cover advanced soft tissue procedures performed in equine surgery. Guest lectures on selected topics will be presented. Laboratory will be given.

*Department(s):* Department of Clinical Studies

**CLIN\*6620 Ruminant Surgery W [0.50]**

Through lectures/seminars, medical and surgical laboratories, and detailed case discussions, this course provides practical experience in ruminant medical, radiological and surgical procedures and in problem-solving related to ruminant practice.

*Department(s):* Department of Clinical Studies

**CLIN\*6700 Pathophysiology in Small Animal Surgery I F,W,S [0.50]**

Based on required reference reading, weekly discussions will cover the disease mechanisms involved in medical problems commonly encountered in small animal surgical practice. Guest lectures on selected topics will be presented.

*Department(s):* Department of Clinical Studies

**CLIN\*6710 Pathophysiology in Small Animal Surgery II F,W,S [0.50]**

Based on required reference reading, weekly discussions will cover the disease mechanisms involved in medical problems commonly encountered in small animal surgical practice. Guest lectures on selected topics will be presented.

*Department(s):* Department of Clinical Studies

**Anesthesiology****CLIN\*6420 Anesthesiology I S [0.50]**

A course in advanced veterinary anesthesia and allied topics such as fluid, acid-base, and electrolyte balance, shock therapy, and cardio pulmonary resuscitation.

*Department(s):* Department of Clinical Studies

**CLIN\*6440 Anesthesiology II F,W,S [0.50]**

A discussion, reading and investigative course on research methods in comparative anesthesiology.

*Prerequisite(s):* CLIN\*6420 is normally a prerequisite

*Department(s):* Department of Clinical Studies

**CLIN\*6460 Anesthesiology III: Species Specific and Coexisting Disease Considerations F-W [0.50]**

A course in advanced veterinary anesthesia that focuses on the scientific literature related to the anesthesia of specific species and veterinary patients with varying underlying diseases.

*Prerequisite(s):* DVM; CLIN\*6420 and CLIN\*6440

*Department(s):* Department of Clinical Studies

**Radiology****CLIN\*6330 Advanced Principles of Diagnostic Imaging U [0.50]**

This course is intended for students pursuing a career in veterinary radiology. Using a lecture-discussion format, the science of x-ray production and the fundamentals of other diagnostic imaging modalities will be presented. The specific applications of these techniques to research and clinical situations will be investigated.

*Department(s):* Department of Clinical Studies

**CLIN\*6350 Advanced Radiology I F,W,S [0.50]**

Radiographic changes seen in diseases of the thorax and abdomen are demonstrated by using radiographs. Contrast and special studies are included where applicable.

*Department(s):* Department of Clinical Studies

**CLIN\*6370 Advanced Radiology II F [0.50]**

A continuation of CLIN\*6350, covering radiographic abnormalities of the neurological and skeletal systems.

*Department(s):* Department of Clinical Studies

**General****CLIN\*6900 Clinical "Grand Rounds" Seminar F-W [0.25]**

This course allows each participant the opportunity to present a clinical case to colleagues in the veterinary school. The topic must be approved by the course co-ordinator. The oral presentation will be evaluated, as will the written presentation, which should be in a form suitable for submission to a veterinary journal.

*Department(s):* Department of Clinical Studies

**CLIN\*6920 Veterinary Clinical Practice I F [0.50]**

These are in-service clinical training courses for intern/graduate-diploma students based on case material presented to the Veterinary Teaching Hospital. Under supervision, the intern/graduate-diploma student, as part of a service team with a faculty clinician, is expected to hone his/her diagnostic, therapeutic and surgical skills, and gain experience with animal restraint and nursing care. They will also develop a problem-oriented approach to health management and disease. Case material studied in each course reflects the clinical problems commonly occurring in the Fall, Winter and Summer semesters respectively.

*Restriction(s):* Instructor consent required.

*Department(s):* Department of Clinical Studies

**CLIN\*6930 Veterinary Clinical Practice II W [0.50]**

These are in-service clinical training courses for intern/graduate-diploma students based on case material presented to the Veterinary Teaching Hospital. Under supervision, the intern/graduate-diploma student, as part of a service team with a faculty clinician, is expected to hone his/her diagnostic, therapeutic and surgical skills, and gain experience with animal restraint and nursing care. They will also develop a problem-oriented approach to health management and disease. Case material studied in each course reflects the clinical problems commonly occurring in the Fall, Winter and Summer semesters respectively.

*Restriction(s):* Instructor consent required.

*Department(s):* Department of Clinical Studies

**CLIN\*6940 Veterinary Clinical Practice III S [0.50]**

These are in-service clinical training courses for intern/graduate-diploma students based on case material presented to the Veterinary Teaching Hospital. Under supervision, the intern/graduate-diploma student, as part of a service team with a faculty clinician, is expected to hone his/her diagnostic, therapeutic and surgical skills, and gain experience with animal restraint and nursing care. They will also develop a problem-oriented approach to health management and disease. Case material studied in each course reflects the clinical problems commonly occurring in the Fall, Winter and Summer semesters respectively.

*Restriction(s):* Instructor consent required.

*Department(s):* Department of Clinical Studies

**CLIN\*6950 Special Topics in Clinical Studies F,W,S [0.50]**

*Department(s):* Department of Clinical Studies

**CLIN\*6990 Project in Clinical Studies F,W,S [1.00]**

This course involves participation in a clinical research project or clinical retrospective study. A review of the relevant literature will be performed. A manuscript suitable for publication in a peer-reviewed journal will be prepared, and the study will be presented in a departmental seminar.

*Restriction(s):* Only available to students enrolled in the MSc by Coursework Program.

*Department(s):* Department of Clinical Studies

## Computational Sciences

The School of Computer Science (SoCS) offers an Interdisciplinary PhD degree in Computational Sciences that encompasses multiple Departments/Schools across the University of Guelph. The program provides a unique opportunity for students to study computing within the context of another discipline commensurate with their interests and career goals. Students entering this PhD program perform research that bridges Computer Science with at least one other discipline such as Economics and Finance, Engineering, English and Theatre Studies, Geography, History, Integrative Biology, Mathematics and Statistics, Pathobiology, Population Medicine and Psychology.

### Administrative Staff

#### Director

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#### Associate Graduate Director

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#### Graduate Program Assistant

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### Graduate Faculty

#### From the School of Computer Science

##### Luiza Antonie

BSc Bucharest, MSc, PhD Alberta - Assistant Professor

##### David A. Calvert

BA, MSc Guelph, PhD Waterloo - Associate Professor

##### David K.Y. Chiu

BA Waterloo, BSc Guelph, MSc Queen's, PhD Waterloo - Professor

##### Rozita Dara

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##### William Gardner

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##### Gary Gréwal

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##### Andrew Hamilton-Wright

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##### Stefan C. Kremer

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##### Xining Li

BSc, MSc Nanjing, PhD Calgary - Professor

##### Pascal Matsakis

BSc, MSc, PhD Paul Sabatier (France) - Professor and Director

##### Judi R. McCuaig

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##### Blair Nonnecke

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##### Charlie F. Obimbo

MSc Kiev, PhD New Brunswick - Associate Professor

##### Joseph Sawada

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##### Stacey Scott

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##### Fei Song

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##### Deborah A. Stacey

BSc Guelph, MSc, PhD Waterloo - Associate Professor

##### Fangju Wang

BE Changsha, MSc Peking, PhD Waterloo - Professor

##### Mark Wineberg

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##### Michael A. Wirth

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##### Yang Xiang

BSs, MSc BUAA (Beijing), PhD UBC - Professor

#### From the Department of Economics and Finance

##### Miana Plesca

BSc Technical University of Cluj (Romania); MA Georgetown (Washington, D.C.); PhD Western - Associate Professor and Interim Associate Dean, Research and Graduate Programs, College of Business and Economics

#### From the School of Engineering

##### Hussein A. Abdullah

BSc Univ. of Technology, MSc, PhD Glasgow, PEng - Professor and Director

##### Shawki Areibi

BASc Al-Fateh, MASc Waterloo, PhD Waterloo, PEng - Professor

##### Fantahun Defersha

BSc Ethiopia, MEng India, PhD Concordia - Assistant Professor

##### Robert Dony

BASc, MASc Waterloo, PhD McMaster, PEng, FIET, FEC - Associate Professor

##### Stefano Gregori

Laurea, Doctorate Univ. of Pavia - Associate Professor

##### Medhat A. Moussa

BSc American, MASc Moncton, PhD Waterloo, PEng - Professor

##### Radu Muresan

Dipl. Engg Technical Univ. of Cluj-Napoca (Romania); MASc, PhD Waterloo, PEng - Associate Professor

##### Beth Parker

BS Pennsylvania, MS North Carolina, PhD Waterloo - Professor

##### Graham Taylor

BASc, MASc Waterloo, PhD Toronto - Assistant Professor

##### Simon X. Yang

BSc Peking, MSc Sinica, MSc Houston, PhD Alberta - Professor

#### From the School of English and Theatre Studies

##### Susan Brown

BA King's College and Dalhousie, MA Dalhousie, PhD Alberta - Professor

#### From the Department of Geography

##### Wanhong Yang

BSc Hubei, MSc Chinese Academy of Sciences, PhD Illinois - Professor

#### From the Department of History

##### Kris E. Inwood

BA Trent, MA, PhD Toronto - Professor

#### From the Department of Integrative Biology

##### Robert Hanner

BSc Eastern Michigan University, PhD University of Oregon - Associate Professor

##### Robert L. McLaughlin

BSc Windsor, MSc Queen's, PhD McGill - Associate Professor

#### From the Department of Mathematics and Statistics

##### Gerarda Darlington

BSc, MSc Guelph, PhD Waterloo - Professor

#### From the Department of Pathobiology

##### Shayan Sharif

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#### From the Department of Population Medicine

##### Amy Greer

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##### David Pearl

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##### Zvonimir Poljak

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#### From the Department of Psychology

##### Naseem Al-Aidroos

BSc Waterloo, MA, PhD Toronto - Assistant Professor

##### Mark J. Fenske

BSc Lethbridge, MA, PhD Waterloo - Associate Professor

##### Lana M. Trick

BSc Calgary, MA, PhD Western Ontario - Associate Professor

#### PhD Program

The objective of the PhD program is to produce interdisciplinary scholars who are capable of tackling emerging problems in a variety of disciplines through investigation and application of current computer technologies. Students require two co-advisors: one from the School of Computer Science; and the second from another discipline (see Graduate Faculty).

## Admission Requirements

In addition to the Office of Graduate Studies admission requirements, applicants must submit: (i) a current CV including research publications; and (ii) a statement of research (maximum of 1500 words). The minimum academic requirement for admission to the PhD program is normally a recognized Master's degree that included a thesis or major independent project. We do not require students entering the program to have a credential in Computer Science. Such students are required to identify their experience using computerized techniques and demonstrate that they have the necessary background to complete the tasks outlined in a research proposal.

In exceptional circumstances, a student who has completed an honours undergraduate Computer Science degree (or an equivalent 4-year undergraduate degree) may apply for direct admission to the PhD program. The successful applicant must have an outstanding academic record, breadth of knowledge in Computer Science, demonstrated research accomplishments, and strong letters of recommendation.

Prospective students should check the School of Computer Science (SoCs) website <http://www.socs.uoguelph.ca/> for further details, procedures and deadlines.

## Degree Requirements

The PhD program requires completion of CIS\*6890: Technical and Communication Research Methodology, coupled with any additional courses and/or Computational Learning Modules assigned by the Advisory Committee on entry to the program. To achieve candidacy, students are expected to present a research proposal in a two-part seminar and successfully complete the Qualifying Examination (QE). Finally, students must present and defend a thesis.

## Courses

<b>CIS*6890 Technical Communication and Research Methodology U [0.50]</b>
<p>This course aims to develop students' ability in technical communication and general research methodology. Each student is expected to present a short talk, give a mini lecture, review a conference paper, write a literature survey and critique fellow students' talks and lectures.</p> <p><i>Department(s):</i> School of Computer Science</p>

## Computer Science

The School of Computer Science offers an MSc degree in Computer Science.

The program emphasizes both academic and applied research that can contribute to further research, academic studies, industry partnerships, and government programs. The MSc degree encompasses professors at the cutting edge of their fields, course offerings covering a wide range of computer science areas, and competitive financial incentives to eligible students.

There are four main fields that students can study in. However, interaction with other disciplines is encouraged and many of our professors work in collaboration with both industry partners and other Schools/Departments at the University of Guelph. The fields are:

- **Applied Modelling (AM):** Students working in this field will engage in research on topics such as graph theory and algorithms, formal specifications, hardware-software co-design, and interdisciplinary work in environmental modeling and disease spread modeling.
- **Artificial Intelligence (AI):** Students working in this field will engage in research on topics such as Bayesian techniques, artificial neural networks, evolutionary computation, fuzzy systems, data mining, pattern recognition, and, intelligent agents.
- **Distributed Computing (DC):** Students working in this field will engage in research on topics such as parallel computing, distributed systems, embedded systems, multi-agent systems, mobile computing, wireless networks, and ad hoc networks.
- **Human Computer Interaction (HCI):** Students working in this field will engage in research on topics such as context-aware systems, usability, interface design, and mobile and ubiquitous computing.

The School of Computer Science also offers an Interdisciplinary PhD degree in Computational Sciences. More information on can be found at: Computational Sciences

### Administrative Staff

#### Director

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#### Graduate Program Coordinator

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#### Graduate Program Assistant

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### Graduate Faculty

#### David A. Calvert

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#### Rozita Dara

BSc Shahid Teheshti, MSc Guelph, PhD Waterloo - Assistant Professor

#### William Gardner

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#### Dan Gillis

BSc, MSc, PhD Guelph - Assistant Professor

#### Gary Gréwal

BSc Brock, MSc, PhD Guelph - Associate Professor

#### Stefan C. Kremer

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BEEd, BSc, MS, PhD Saskatchewan - Associate Professor

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MSc Kiev, PhD New Brunswick - Associate Professor

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BSc, PhD Victoria (British Columbia) - Associate Professor and Graduate Program Coordinator

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BSc Jilin (China), MSc Academia Sinica (China), PhD Waterloo - Associate Professor

#### Deborah A. Stacey

BSc Guelph, MAsC, PhD Waterloo - Associate Professor

#### Fangju Wang

BE Changsha, MSc Peking, PhD Waterloo - Professor

#### Mark Wineberg

BSc Toronto, MSc, PhD Carleton - Associate Professor

#### Michael A. Wirth

BSc New England (Aust.), MSc Manitoba, PhD RMIT Melbourne - Associate Professor

#### Yang Xiang

BSs, MSc BUAA (Beijing), PhD UBC - Professor

### MSc Program

The MSc is offered in the fields of: 1) applied modelling; 2) artificial intelligence; 3) distributed computing; and 4) human computer interaction.

### Admission Requirements

Most spaces are filled in March for entry the following September, and in October for entry the following January. Prospective students should check the School of Computer Science website <http://www.socs.uoguelph.ca/> for admission procedures and deadlines.

#### General Requirements

To be considered for admission, applicants must have a four-year honours degree in computer science, or a four-year honours degree in another discipline with a minor in computer science. Applicants must meet the minimum admission requirements of both the university and the School of Computer Science, including at least a 75% average during the previous two years of full-time university study for a degree.

In addition to the university and School of Computer Science requirements, applicants must also submit (i) a current CV and (ii) a statement of research that would normally include the following sections:

- Specific research interest with justification.
- Academic and/or practical research experience.

#### Course Requirement

Entrants who have a four-year honours degree in another discipline and a minor (or equivalent) in computer science must have taken at least 12 courses as described below. University of Guelph equivalents are given for comparison as appropriate.

(A) Seven prescribed courses:

- An introductory programming course (CIS\*1500).
- An intermediate programming course (CIS\*2500).
- An object-oriented programming course (CIS\*2430).
- A software systems development course (CIS\*2750).
- A course on data structures (CIS\*2520).
- A course on discrete structures (CIS\*1910 or CIS\*2910).
- An introductory course in calculus (MATH\*1200).

(B) Three core courses at the second-year or higher level selected from the following:

- A course on hardware and/or assembly language (CIS\*2030).
- A course on digital systems (CIS\*3120).
- A course on simulation and/or modelling (CIS\*2460).
- A database course (CIS\*3530).
- An operating systems course (CIS\*3110).
- A computer algorithms course (CIS\*3490).
- A course on automata theory (CIS\*3150).
- A statistics course (STAT\*2040).

(C) Two elective courses at the third-year or higher level:

- These courses should be related to the applicant's proposed research area. They can be from a discipline other than computer science if deemed relevant by the proposed supervisor.

Applicants who meet requirements (A) and (C) but who do not meet requirement (B) may be granted provisional admission, i.e., they may be granted admission with the provision that they take specified courses within a specified time and achieve grades above a specified threshold.

#### English Proficiency

A test of English proficiency is required of all applicants whose first language is not English. Please refer to the University of Guelph [Admission Requirements](#)

### Degree Requirements

Once a student has been admitted to the MSc program, the following components are required for the successful completion of the MSc degree:

Completion of the Technical Communication and Research Methodology course (CIS\*6890) and at least four other graduate courses

Completion of the seminar requirement.

An accepted thesis.

#### Duration of the Program

The MSc degree is a two-year program during which students complete five courses, give a public seminar and complete and successfully defend a thesis. Heavy emphasis is placed on the thesis, which usually requires at least two semesters. Students should plan on spending at least four full-time semesters (16 months) in the program assuming adequate preparation for graduate work.

### Course Requirement

An MSc student is required to take the Technical Communication and Research Methodology course CIS\*6890 and at least four other CIS graduate courses. Of these four courses, at least two should be outside of the student's thesis topic area. This area and the courses which fall outside of this area are identified by the student's advisor. With approval from the Graduate Program Committee, a CIS graduate course requirement may also be met by a non-CIS graduate course or by a 4000-level course. At most one reading course (CIS\*6660) and at most one 4000-level course can count towards the course requirement.

### Seminar Requirement

An MSc student must give one publicly announced research seminar on his/her MSc thesis research. The student will be allocated times and dates for the seminar. It must be attended by the student's advisor and at least one other member of the student's Advisory Committee. The quality of the presentation is graded on a pass/fail basis. The MSc seminar requirement is intended for students to practice presentation and communication skills and to participate in the process of knowledge dissemination as part of the academic life.

### Thesis Defence

Arrangements for the MSc thesis defence should be made at least four weeks prior to the anticipated date of the defence, and the student must submit his/her MSc thesis to the Examination Committee at least two weeks prior to the defence. The examination consists of an oral presentation by the student followed by questions from the Examination Committee.

### Courses

#### Core Courses

The core graduate courses are designed to be accessible to any student with an appropriate background in Computer Science and will provide enough introduction for those unfamiliar with the specific area to allow them to keep up with the advanced material.

#### CIS\*6000 Distributed Systems U [0.50]

The evolution of distributed computer systems. Models for distributed processing. Taxonomy of multiprocessor systems. Interconnection networks. Memory and I/O for distributed architectures. Performance of distributed systems. Architectural issues of distributed systems

*Department(s):* School of Computer Science

#### CIS\*6020 Artificial Intelligence U [0.50]

An examination of Artificial Intelligence principles and techniques such as: logic and rule based systems; forward and backward chaining; frames, scripts, semantic nets and the object-oriented approach; the evaluation of intelligent systems and knowledge acquisition. A sizeable project is required and applications in other areas are encouraged.

*Department(s):* School of Computer Science

#### CIS\*6030 Information Systems U [0.50]

Relational and other database systems, web information concurrency protocols, data integrity, transaction management, distributed databases, remote access, data warehousing, data mining.

*Department(s):* School of Computer Science

#### CIS\*6070 Discrete Optimization U [0.50]

This course will discuss problems where optimization is required and describes the most common techniques for discrete optimization such as the use of linear programming, constraint satisfaction methods, and genetic algorithms.

*Department(s):* School of Computer Science

#### CIS\*6320 Image Processing Algorithms and Applications U [0.50]

Brightness transformation, image smoothing, image enhancement, thresholding, segmentation, morphology, texture analysis, shape analysis, applications in medicine and biology.

*Department(s):* School of Computer Science

#### CIS\*6420 Soft Computing U [0.50]

Neural networks, artificial intelligence, connectionist model, back propagation, resonance theory, sequence processing, software engineering concepts.

*Department(s):* School of Computer Science

#### CIS\*6890 Technical Communication and Research Methodology U [0.50]

This course aims to develop students' ability in technical communication and general research methodology. Each student is expected to present a short talk, give a mini lecture, review a conference paper, write a literature survey and critique fellow students' talks and lectures.

*Department(s):* School of Computer Science

#### Advanced Courses

The advanced graduate courses are taught with the assumption that the student has sufficient background in the research area to understand the advanced concepts and research ideas. Students who intend to take a course for which they have insufficient background should consult with the instructor prior to enrollment in the course.

#### CIS\*6050 Neural Networks U [0.50]

Artificial neural networks, dynamical recurrent networks, dynamic input/output sequences, communications signal identification, syntactic pattern recognition.

*Department(s):* School of Computer Science

#### CIS\*6060 Bioinformatics U [0.50]

Data mining and bioinformatics, molecular biology databases, taxonomic groupings, sequences, feature extraction, Bayesian inference, cluster analysis, information theory, machine learning, feature selection.

*Department(s):* School of Computer Science

#### CIS\*6080 Genetic Algorithms U [0.50]

This course introduces the student to basic genetic algorithms, which are based on the process of natural evolution. It is explored in terms of its mathematical foundation and applications to optimization in various domains.

*Department(s):* School of Computer Science

#### CIS\*6090 Hardware/Software Co-design of Embedded Systems U [0.50]

Specification and design of embedded systems, system-on-a-chip paradigm, specification languages, hardware/software co-design, performance estimation, co-simulation and validation, processes architectures and software synthesis, retargetable code generation and optimization.

*Department(s):* School of Computer Science

#### CIS\*6100 Parallel Processing Architectures U [0.50]

Parallelism in uniprocessor systems, parallel architectures, memory structures, pipelined architectures, performance issues, multiprocessor architectures.

*Department(s):* School of Computer Science

#### CIS\*6120 Uncertainty Reasoning in Knowledge Representation U [0.50]

Representation of uncertainty, Dempster-Schafer theory, fuzzy logic, Bayesian belief networks, decision networks, dynamic networks, probabilistic models, utility theory.

*Department(s):* School of Computer Science

#### CIS\*6130 Object-Oriented Modeling, Design and Programming U [0.50]

Objects, modeling, program design, object-oriented methodology, UML, CORBA, database

*Department(s):* School of Computer Science

#### CIS\*6140 Software Engineering U [0.50]

This course will discuss problems where optimization is required and describes the most common techniques for discrete optimization such as the use of linear programming, constraint satisfaction methods, and meta-heuristics.

*Department(s):* School of Computer Science

#### CIS\*6160 Multiagent Systems U [0.50]

Intelligent systems consisting of multiple autonomous and interacting subsystems with emphasis on distributed reasoning and decision making. Deductive reasoning agents, practical reasoning agents, probabilistic reasoning agents, reactive and hybrid agents, negotiation and agreement, cooperation and coordination, multiagent search, distributed MDP, game theory, and modal logics.

*Department(s):* School of Computer Science

#### CIS\*6200 Design Automation in Digital Systems U [0.50]

Techniques and software tools for design of digital systems. Material covered includes high-level synthesis, design for testability, and FPGAs in design and prototyping.

*Department(s):* School of Computer Science

#### CIS\*6490 Analysis and Design of Computer Algorithms U [0.25]

The design and analysis of efficient computer algorithms: standard methodologies, asymptotic behaviour, optimality, lower bounds, implementation considerations, graph algorithms, matrix computations (e.g. Strassen's method), NP-completeness.

*Department(s):* School of Computer Science

#### CIS\*6650 Topics in Computer Science I U [0.50]

This special topics course examines selected, advanced topics in computer science that are not covered by existing courses. The topic(s) will vary depending on the need and the instructor.

*Department(s):* School of Computer Science

#### CIS\*6660 Topics in Computer Science II U [0.50]

This is a reading course. Its aim is to provide background knowledge to students who need to get a head-start in their thesis research fields early during their program while no suitable regular graduate courses are offered. Admission is under the discretion of the instructor.

*Restriction(s):* Instructor consent required.

*Department(s):* School of Computer Science

## Creative Writing

The Master of Fine Arts (MFA) Program in Creative Writing is designed to prepare students for careers in creative writing, by exploring and developing their skills as writers, and providing them with a wide range of opportunities to connect with the arts and culture community. Critically acclaimed writers and literary professionals participate in the program as workshop instructors, mentors and visitors. Through its master classes, workshops and plenary courses, the MFA Program aims to assist new writers in locating their work in both a global and a national context. Students will pursue the program on a full-time basis. The program has been designed to facilitate completion within two years.

### Administrative Staff

#### Director

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#### Graduate Program Coordinator

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#### Assistant to the Graduate Program Coordinator, MFA Creative Writing Program

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### Graduate Faculty

#### Dionne Brand

BA, MA O.I.S.E. Toronto - Professor and University Research Chair

#### Catherine Bush

BA Yale - Assistant Professor

#### Judith Thompson

BA Queen's, Cert. National Theatre School - Professor

### Associated Graduate Faculty

#### Karen Connelly

Author

#### Kevin Connolly

BA York - Poet

#### Camilla Gibb

BA Toronto, DPhil Oxford - June Callwood Professor, Victoria College, Univ. of Toronto

#### Kathryn Kuitenbrouwer

BA Ottawa - Writer

#### Russell Smith

Writer

#### Susan Swan

BA McGill - Author

#### Michael Winter

Writer

### MFA Program

#### Admission Requirements

The normal minimum requirement for admission to the MFA Program is a baccalaureate degree, in an honours program or the equivalent, from a recognized degree-granting institution. There are no requirements as to the discipline in which the degree was earned. Successful applicants will be expected to have achieved an average standing of at least a 'B-' in their last four semesters of study. A limited number of students, however, may be admitted to the MFA without having satisfied the degree requirement and/or academic standing requirements set out above if they are assessed as qualified to undertake graduate studies in creative writing on the basis of other experience and/or practice.

#### Admissions Portfolio

Students will be selected for admission to the MFA program primarily on the basis of a portfolio. The portfolio should be between 25 and 40 pages in length and may contain published and/or unpublished work and/or work-in-progress. It must include a minimum of two separate works (or excerpts from separate works). Applicants are encouraged to submit works in more than one genre, e.g., fiction and poetry. Considerations of balance over the program as a whole, with respect to genres in which applicants are particularly interested and particularly strong, will have some impact on admission decisions.

#### Degree Requirements

Students will take one workshop and one plenary course in the first (Fall) semester of study; one workshop in the second (Winter) semester; the individual study course in the third (Summer) semester; and one workshop and a second plenary course in the fourth (Fall) semester. The remaining two semesters of the two-year program will be devoted to the thesis. With permission, MFA students may choose to take one or two courses at the University of Guelph - e.g., MA courses in the School of English and Theatre Studies. All students will be required to complete at least six semesters of study.

### Plenary Courses

There are two Plenary courses, CRWR\*6000 and CRWR\*6010, and both are required courses for MFA students. Plenary courses will be offered on an alternate-year basis in the Fall semester, allowing students to take one in the Fall semester of their first year, and one in the Fall semester of their second year. These courses are intended in part to provide a forum for visiting writers and other literary professionals. Each course will also have a substantial component addressing practical matters associated with the progress of a writer's career.

### Workshops

Students are required to take three workshops over the course of the program; the genres in which workshops will be offered are fiction, poetry, drama, and creative non-fiction. Students are also required to ensure through their selection of workshops that they work in a minimum of two separate genres and are strongly encouraged to take workshops that include work in at least three genres. The workshops will be strongly focused on writing, but each will also incorporate a substantial reading component.

### Individual Study Course

The individual study course, required in the third (Summer) semester of the program, pairs each student with a mentor. It is intended to install within the curriculum a critical opportunity to address the variable learning needs of individual students. For the majority of students, it will be an intensive writing course, supplemented by a reading component that allows for additional work in the student's primary genre and offers the chance to build a body of work towards the thesis. For some students, it may be primarily a reading course, with practice in writing in relation to particular models, or provide an opportunity to develop a significant project in a secondary genre.

### Thesis

The thesis is the single most important component of the MFA Program. Students should register for UNIV\*7500 in each semester that they are writing their thesis. The thesis may be a novel, a book-length manuscript of poems, a collection of short stories, a full-length play or screenplay, or a work of creative non-fiction. The standard to be applied is that the thesis should not be a first draft but have undergone significant revision and be approaching publishable quality in the estimation of the examiners.

### Courses

For courses without a semester designation the student should consult the Associate Coordinator or Assistant to the Associate Coordinator.

<b>CRWR*6000 Plenary Course: Writers on Writing F [0.50]</b>
This required plenary course addresses important historical and contemporary perspectives on creative writing as an art, a practice, and a profession. Readings, discussion and visits from writers and other literary professionals will help students to articulate effectively their own literary aesthetic and to develop professional skills.
<i>Restriction(s):</i> MFA.CW students only
<i>Department(s):</i> School of English and Theatre Studies
<b>CRWR*6010 Plenary Course: Writers in the World F [0.50]</b>
This required plenary course addresses changing and conflicting ideas about the responsibilities of the writer in the world. Readings, discussion, and visits from writers and other literary professionals will help students to articulate effectively their own positions and to develop professional skills.
<i>Restriction(s):</i> MFA.CW students only
<i>Department(s):</i> School of English and Theatre Studies
<b>CRWR*6100 Poetry Workshop F-W [0.50]</b>
The Poetry Workshop engages students in an intensive program of reading and writing work. The workshops will be strongly focused on writing and on responding to the work of students in the course with productive, constructive criticism. Students will have the opportunity to work closely with a nationally recognized poet to develop their own skills as poets and editors. Students are expected to read widely and to develop their understanding of the technical aspects of their craft.
<i>Restriction(s):</i> MFA.CW students only
<i>Department(s):</i> School of English and Theatre Studies
<b>CRWR*6200 Fiction Workshop F-W [0.50]</b>
The Fiction Workshop engages students in an intensive program of reading and writing work. The workshops will be strongly focused on writing and on responding to the work of students in the course with productive, constructive criticism. Students will have the opportunity to work closely with a nationally recognized author to develop their skills as writers and editors. Students are expected to read widely and to develop their understanding of the technical aspects of their craft.
<i>Restriction(s):</i> MFA.CW students only
<i>Department(s):</i> School of English and Theatre Studies

**CRWR\*6300 Drama Workshop U [0.50]**

The Drama Workshop engages students in an intensive program of writing and reading work. Students will produce a substantial amount of dramatic writing and will also provide constructive criticism of the work of other workshop participants. Required reading will cover a wide range of dramatic literature and the study of dramatic forms and techniques.

*Restriction(s):* MFA.CW students only

*Department(s):* School of English and Theatre Studies

**CRWR\*6400 Practicum in Creative Writing U [0.50]**

In this course of guided study, the student will work on a creative project with a mentor who is a recognized member of the professional writing community.

*Restriction(s):* MFA.CW students only

*Department(s):* School of English and Theatre Studies

**CRWR\*6500 Non-Fiction Workshop U [0.50]**

The Non-Fiction Workshop engages students in a reading and writing intensive program of creative non-fiction. The workshops will be strongly focused on writing and will involve the creation and revision of a substantial body of new work in the genre, as well as critiquing the work of other students in the course. The reading component will focus on texts from a varied social and cultural range (e.g. family memoir, travel narrative, cultural memoir, themed meditation).

*Restriction(s):* MFA.CW students only

*Department(s):* School of English and Theatre Studies

**CRWR\*6600 Special Topics in Creative Writing U [0.50]**

A variable-content course focusing on a particular issue or approach to writing within one genre of creative writing (fiction, poetry, drama, etc.) or a particular issue or approach to writing that is at work across multiple genres.

*Department(s):* School of English and Theatre Studies

## Criminology and Criminal Justice Policy

The MA in Criminology and Criminal Justice Policy (CCJP) is a program jointly run by the Department of Sociology and Anthropology and the Department of Political Science. As such, the program offers a unique opportunity for students to pursue advanced studies and research in crime and the criminal justice system from both sociological and criminological perspectives as well as from political science and public policy and management perspectives.

### Administrative Staff

#### Chair, Department of Political Science

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### Graduate Faculty

#### Dennis Baker

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#### Ryan Broll

MA, PhD Western - Assistant Professor

#### Myrna Dawson

BA York, MA, PhD Toronto - Professor

#### Andrew Hathaway

BA, MA Calgary, PhD McMaster - Associate Professor

#### Madonna Maidment

BA, MA Memorial, PhD Carleton - Associate Professor

#### Mavis Morton

BA Carleton, MA, PhD York - Associate Professor

#### William O'Grady

BA, MA Carleton, PhD Toronto - Professor

#### Patrick Parnaby

BA, MA Queen's, PhD McMaster - Associate Professor

#### Troy Riddell

BA, MA Calgary, PhD McGill - Associate Professor

#### Byron M. Sheldrick

BA Carleton, LLB Toronto, MA, PhD York - Associate Professor

#### Ron Stansfield

BSc McMaster, BA, MA Toronto, PhD York - Associate Professor

#### Carolyn Yule

BA UBC, MA, PhD Toronto - Assistant Professor

### MA Program

### Admission Requirements

The program requires a 4-year undergraduate degree in Sociology, Criminology or Political Science, but students with at least 5 courses in one or more of these three disciplines may be admitted as long as these were part of a major in another social science or humanities program. The program requires a minimum of a "B+" average to be considered for admission. Generally, those admitted will have a higher academic average.

### Degree Requirements

Students enrol in one of two study options: 1) course work or course work and major research paper, or 2) thesis option. These options are detailed below.

### Course Work

Students are required to complete five (5) core courses and three (3) electives for a total of 4.0 credits.

The core courses are:

CCJP*6000	[0.50]	Courts
CCJP*6100	[0.50]	Governing Criminal Justice
CCJP*6200	[0.25]	Professional Seminar in CCJP
CCJP*6300	[0.75]	Research Methods in Criminal Justice
SOC*6350	[0.50]	Society, Crime and Control

Three elective courses from the list found in the Courses section below.

### Course Work and Major Research Paper (MRP)

Students are required to complete five (5) core courses, one (1) elective and the MRP.

The core courses are:

CCJP*6000	[0.50]	Courts
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CCJP*6100	[0.50]	Governing Criminal Justice
CCJP*6200	[0.25]	Professional Seminar in CCJP
CCJP*6300	[0.75]	Research Methods in Criminal Justice
SOC*6350	[0.50]	Society, Crime and Control

One elective from the list found in the Courses section below and the MRP completed under the supervision of a faculty supervisor:

CCJP*6660	[1.00]	Major Research Paper
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### Thesis

Students are required to complete four (4) core courses and a thesis.

The core courses are:

CCJP*6100	[0.50]	Governing Criminal Justice
CCJP*6200	[0.25]	Professional Seminar in CCJP
CCJP*6300	[0.75]	Research Methods in Criminal Justice
SOC*6350	[0.50]	Society, Crime and Control

### Courses

For courses without a semester designation the student should consult the Graduate Program Coordinator.

### Core Courses

CCJP*6000 Courts W [0.50]		
This course examines courts from a variety of political, social, and socio-legal perspectives depending on the interest of the instructor(s). Particular attention will be paid to the role of courts in shaping criminal justice policy through such means as constitutional decisions and sentencing decisions.		
<i>Restriction(s):</i>	CCJP students. Instructor consent required.	
<i>Department(s):</i>	Department of Sociology and Anthropology, Department of Political Science	

CCJP*6100 Governing Criminal Justice F [0.50]		
This course analyzes criminal justice policy and governance of the criminal justice system from applied and theoretical perspectives. Particular attention is paid to the interplay between criminal justice policy and management and the larger political process.		
<i>Restriction(s):</i>	CCJP students	
<i>Department(s):</i>	Department of Political Science	

CCJP*6200 Professional Seminar in CCJP F,W [0.25]		
This course introduces students to graduate studies in the program; to the professions of sociology, political science and criminology; and to professional life in occupations related to criminal justice. It includes information on the following: the program and how it relates to criminology, sociology and political science; library and computer research; research in the field; challenges facing criminal justice professionals; applying for further graduate study and research funding; and skill development.		
<i>Restriction(s):</i>	CCJP students	
<i>Department(s):</i>	Department of Sociology and Anthropology, Department of Political Science	

CCJP*6300 Research Methods in Criminal Justice F [0.75]		
This course introduces students to the primary methods, data sources and statistical methods used in criminal justice and criminology research. Particular attention will be paid to the role research and methods and statistics play in shaping criminal justice/criminological theory, research and policy.		
<i>Restriction(s):</i>	CCJP students. Instructor consent required.	
<i>Department(s):</i>	Department of Sociology and Anthropology	

SOC*6350	[0.50]	Society, Crime and Control
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### Elective Courses

SOC*6070	[0.50]	Sociological Theory
SOC*6130	[0.50]	Quantitative Research Methods
SOC*6140	[0.50]	Qualitative Research Methods
SOC*6270	[0.50]	Diversity and Social Equality
POLS*6400	[0.50]	Comparative Social Policy
POLS*6630	[0.50]	Approaches to Public Policy
POLS*6640	[0.50]	Canadian Public Administration: Public Sector Management
POLS*6950	[0.50]	Specialized Topics in Political Studies
SOC*6600	[0.50]	Reading Course

### Major Research Paper Course

CCJP*6660 Major Research Paper S,F,W [1.00]		
The major paper is an extensive research paper for those who do not elect to complete a thesis. It may be taken over two semesters.		
<i>Restriction(s):</i>	Restricted to CCJP graduate students	
<i>Department(s):</i>	Department of Sociology and Anthropology, Department of Political Science	

## Economics

The Department of Economics and Finance offers programs of study leading to the MA and PhD degrees in the following fields: 1) Econometrics, 2) Financial Economics, 3) Resources, Environment and Energy, 4) Development and Growth and 5) Applied Microeconomics.

- Econometrics (PhD)
- Financial Economics (MA, PhD)
- Resources, Environment and Energy (PhD)
- Development and Growth (PhD)
- Applied Microeconomics (PhD)

### Administrative Staff

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### Graduate Faculty

#### J. Atsu Amegashie

BA Ghana, MA Queen's, MA Dalhousie, PhD Simon Fraser - Professor

#### Kurt Annen

MA, PhD Fribourg (Switzerland) - Associate Professor

#### C. Bram Cadsby

BSc London School of Economics, MA Queen's, PhD MIT - Professor

#### Laurent Cellarier

BA, MA Limoges (France); PhD Southern California - Associate Professor

#### Brian S. Ferguson

BA Mount Allison, MA Guelph, PhD Australian National - Professor

#### Talat Genc

BS, MA Bogazici, MA, Ms, PhD Arizona - Associate Professor

#### Johanna Goertz

BSc Bonn, MA, PhD Ohio State - Assistant Professor

#### Louise A. Grogan

BSc London School of Economics, MA Catholique de Louvain, PhD Amsterdam - Associate Professor

#### Michael J. Hoy

BMath Waterloo, PhD London School of Economics - Professor

#### Kris E. Inwood

BA Trent, MA, PhD Toronto - Professor

#### Rene Kirkegaard

BA, MSc, PhD Aarhus - Associate Professor

#### Stephen Kosempel

BA Queen's, MA Victoria, PhD Simon Fraser - Associate Professor and Chair

#### Mei Li

BA, MA Wuhan, MA, PhD Queen's - Assistant Professor

#### Patrick Martin

BA California (Irvine), MA Cornell, PhD Guelph - Assistant Professor

#### Alex Maynard

BA Cornell, MA, MPhil, PhD Yale - Professor

#### Chris J. McKenna

BSc Salford, DPhil York - Professor

#### Ross McKittrick

BA Queen's, MA, PhD British Columbia - Professor

#### Miana Plesca

BSc Technical University of Cluj (Romania); MA Georgetown (Washington, D.C.); PhD Western Ontario - Assistant Professor

#### David M. Prescott

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#### Asha Sadanand

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#### Thanasis Stengos

BSc, MSc London School of Economics, PhD Queen's - Professor

#### Yiguo Sun

BSc Hebei Normal, MSc Hebei Teacher's, MA Guelph, PhD Toronto - Associate Professor

#### Francis Tapon

DES Paris, MBA Columbia, MA, PhD Duke - Professor

#### Henry Thille

BComm Saskatchewan, MA, PhD British Columbia - Associate Professor

#### Ilias Tsiakas

BA Toronto, MA York, PhD Toronto - Associate Professor

### MA Program

The MA program contains core courses in theory and quantitative methods.

### Admission Requirements

The university requires that students have the equivalent of an honours degree at the baccalaureate level.

Admission to the MA program requires that students have a solid background in economic theory and econometrics from a recognized undergraduate program. Normally, the Department requires a 'B+' average as a minimum.

Students whose background is not in economics but who are otherwise outstanding should consult the [Department website](#) for further information. Applicants whose background in economics is difficult to evaluate may be granted admission as a provisional graduate student for one semester. If, at the end of the semester, the Department is satisfied with the student's progress, it will recommend to the Assistant Vice-President (Graduate Studies) that the student be transferred to regular graduate student status.

Program offices should be consulted for admission deadlines.

### Degree Requirements

The MA requires the completion of a minimum of 4.0 course credits. Most one-semester courses have 0.5 course credits. With approval from the Department, up to 1 credit of the required 4 credits can be taken outside the Department of Economics and Finance. However, students may, with approval, take additional courses from other Departments provided that their program includes at least six course equivalents (3.0 credits) from the Department of Economics and Finance. The minimum duration of the program is 2 semesters of full-time study as a regular graduate student. There are two options to the MA in Economics: (i) by course work, and (ii) by course work and major research paper.

### Course Work:

A minimum of 4.0 credits is required, including:

1. The Economics Core (1.5 credits)

ECON*6020	[0.50]	Macroeconomic Theory I
ECON*6500	[0.50]	Microeconomic Theory MA
ECON*6140	[0.50]	Econometrics I
or		
ECON*6180	[0.50]	Econometric Methods

2. Five additional courses (2.5 credits). At least two courses must have substantial research components (50% or more of the total course grade).

### Course Work and Major Research Project:

A minimum of 4.0 credits is required, including:

1. The Economics Core (1.5 credits)

ECON*6020	[0.50]	Macroeconomic Theory I
ECON*6500	[0.50]	Microeconomic Theory MA
ECON*6140	[0.50]	Econometrics I
or		
ECON*6180	[0.50]	Econometric Methods

2. Three additional courses (1.5 credits)

3. ECON\*6940 [1.00] Research Project

### Course Work in the Field of Financial Economics

A minimum of 4.0 credits is required, including:

1. The Economics Core (1.5 credits)

ECON*6020	[0.50]	Macroeconomic Theory I
ECON*6500	[0.50]	Microeconomic Theory MA
ECON*6140	[0.50]	Econometrics I
or		
ECON*6180	[0.50]	Econometric Methods

2. The Finance Core (1.5 credits)

ECON*6380	[0.50]	Financial Economics
ECON*6390	[0.50]	Empirical Finance and Financial Econometrics
ECON*6820	[0.50]	Security Analysis and Portfolio Management

Note that all courses in the finance core have substantial research components (50% or more of the total course grade).

3. Two additional courses (1.0 credits). Students are encouraged to take:

ECON*6320	[0.50]	International Finance
ECON*6490	[0.50]	Money and Banking

### Course Work and Major Research Project in the Field of Financial Economics

1. The Economics Core (1.5 credits)

ECON*6020	[0.50]	Macroeconomic Theory I
ECON*6500	[0.50]	Microeconomic Theory MA
ECON*6140	[0.50]	Econometrics I

or		
ECON*6180	[0.50]	Econometric Methods
2. The Finance Core (1.5 credits)		
ECON*6380	[0.50]	Financial Economics
ECON*6390	[0.50]	Empirical Finance and Financial Econometrics
ECON*6820	[0.50]	Security Analysis and Portfolio Management
3. ECON*6940	[1.00]	Research Project

## PhD Program

The objective of the PhD program is to train individuals who already have a strong background in economics to become independent and skilled researchers, in preparation for a career in academia, government or the private sector. Course offerings cover a broad range of topics in theoretical and applied economics. PhD candidates may write a dissertation in any of the areas of expertise of the graduate faculty in the Department.

Graduates are expected to have demonstrated competence at an advanced level in the core areas of Microeconomic theory, Macroeconomic theory, and Econometrics, to have demonstrated competence at the cutting edge of knowledge in their area of specialization and advanced competence in at least one other area, and to have demonstrated mature scholarship, research and communication abilities.

## Admission Requirements

Applicants to the PhD program should have a master's degree in economics with a minimum average of 80% (A-) in their postgraduate studies. Applicants without a master's degree but with an outstanding record at the baccalaureate level, may be admitted initially to the MA program in economics. For students who achieve a superior record and show an aptitude for research, The Board of Graduate Studies, on the recommendation of the Department, may authorize transfer to the PhD program without requiring the student to complete a master's degree.

## Degree Requirements

The program requires the satisfactory completion of a minimum of 12 courses covering core theory, econometrics, and field courses. (Students with an MA will be given credit for courses already in hand, where appropriate). The following sequence of milestones represents the typical path through the PhD program.

### Year I: Core Courses

Students must complete the following courses, in preparation for the comprehensive examinations in economic theory, which is written at the end of Year I:

#### Econometrics

ECON*6140	[0.50]	Econometrics I
ECON*6160	[0.50]	Econometrics II

#### Theory

ECON*6000	[0.50]	Microeconomic Theory I
ECON*6010	[0.50]	Microeconomic Theory II
ECON*6020	[0.50]	Macroeconomic Theory I
ECON*6040	[0.50]	Macroeconomic Theory II

### Year II: Dissertation Proposal

After the theory comprehensive exams are passed, students must prepare a PhD proposal under the supervision of a faculty member. Proposals are presented to the Department at a symposium, and upon acceptance the Graduate Program Coordinator will notify the Assistant Vice-President (Graduate Studies) that the student has passed the "Qualifying Examination" requirement as set out by the Faculty of Graduate Studies. At this point, the student becomes a "candidate" for the PhD.

### Year III and IV: Thesis

Submission and defence of an acceptable thesis on a topic approved by the student's advisory committee completes the requirements for the PhD. The thesis is expected to be a significant and original contribution to knowledge in its field and must demonstrate scholarship and critical judgement on the part of the candidate. Theses must be submitted within 48 months of completing the minimum duration.

## Collaborative Specializations

### International Development Studies

The Department of Economics and Finance participates in the International Development Studies (IDS) MA collaborative specialization. Applicants for this collaborative specialization enter through one of the participating departments; course selections are based, in part, on the applicant's primary discipline. Those faculty members in the Department of Economics and Finance whose research and teaching expertise includes aspects of international development studies may serve as advisors for these MA students. Please consult the International Development Studies listing for a detailed description of the MA collaborative specialization including the special additional requirements for each of the participating departments.

## Courses

### Economic Theory

#### ECON\*6000 Microeconomic Theory I U [0.50]

A graduate course in microeconomics, intended for PhD students, presenting a rigorous treatment of the analysis of choices for consumers and producers with and without strategy and uncertainty, partial and general equilibrium, and the fundamental theorems of welfare economics.

*Department(s):* Department of Economics and Finance

#### ECON\*6010 Microeconomic Theory II U [0.50]

Advanced topics in modern microeconomics to include elements of game theory, information economics, economics of risk and uncertainty, the theory of incentives and others.

*Prerequisite(s):* ECON\*6000

*Department(s):* Department of Economics and Finance

#### ECON\*6020 Macroeconomic Theory I U [0.50]

A first graduate course in macroeconomics, presenting a rigorous introduction to the tools and basic models of dynamic general equilibrium theory. The topics covered include economic growth and development, economic fluctuations, and monetary and fiscal policies.

*Department(s):* Department of Economics and Finance

#### ECON\*6040 Macroeconomic Theory II U [0.50]

This course considers the dynamics resulting from intertemporal optimization models. Foundations of unemployment theory. Approaches to business cycles. Models of long-run growth.

*Prerequisite(s):* ECON\*6020

*Department(s):* Department of Economics and Finance

#### ECON\*6060 Mathematical Methods for Economics F [0.00]

This course is designed to provide students with the necessary mathematical tools to follow the contents of the core economics and econometrics courses in the MA program and successfully complete them. The material covered will include advanced topics in linear algebra, multivariate optimization techniques and comparative statics.

*Department(s):* Department of Economics and Finance

#### ECON\*6090 Game Theory U [0.50]

This course introduces the student to game theory, which is an important tool for modelling economic situations with multi-person interaction. Economic applications such as oligopoly, bargaining, auctions, and public goods provision will be discussed. Broader applications to voting games, candidate strategy, war games, and parlour games will also be briefly discussed. Students need to be very familiar with optimization and single person decision-making.

*Department(s):* Department of Economics and Finance

#### ECON\*6100 Experimental Economics U [0.50]

This course examines the use of the experimental methodology in economics. We will study how experiments have been used to test theories in many subfields within economics. In the process, students will learn how to construct and run economics experiments and analyze experimental data.

*Department(s):* Department of Economics and Finance

#### ECON\*6110 Mathematical Economics U [0.50]

This course introduces students to the mathematical techniques used in advanced economic analysis. Topics covered in any year: analysis of dynamic economic models and optimization in dynamic economic models.

*Department(s):* Department of Economics and Finance

#### ECON\*6500 Microeconomic Theory MA U [0.50]

A first graduate course in microeconomics, intended for Master students, presenting a rigorous treatment of the analysis of choices in markets and organizations. It covers consumer theory, general equilibrium, uncertainty, game theory, and information economics.

*Restriction(s):* Restricted to MA students only.

*Department(s):* Department of Economics and Finance

## Econometrics

#### ECON\*6050 Introduction to Econometric Methods U [0.50]

Introduction to the specification, estimation and testing of economic models. Topics include the classical linear regression model, t tests, structure tests, specification error, the consequences of the violation of the classical assumptions, detection and correction of autocorrelation and heteroscedasticity.

*Department(s):* Department of Economics and Finance

**ECON\*6140 Econometrics I U [0.50]**

Topics include a review of the classical linear regression model, applications of generalized least squares, maximum likelihood methods and various statistical test procedures.

*Department(s):* Department of Economics and Finance

**ECON\*6160 Econometrics II U [0.50]**

Topics include maximum likelihood as a method of estimation and inference, nonlinear estimation and simultaneous equations. Also more specialized topics such as limited-dependent-variable models and non-parametric regression methods may be covered.

*Department(s):* Department of Economics and Finance

**ECON\*6170 Topics in Econometrics U [0.50]**

This is an advanced econometrics topics course that covers the area of non-parametric and semiparametric estimation and testing of econometrics models, including time series and panel data semiparametric models.

*Department(s):* Department of Economics and Finance

**ECON\*6180 Econometric Methods U [0.50]**

This course follows ECON\*6050. It covers estimation by instrumental variables, estimations of simultaneous systems, asymptotic distribution theory, maximum likelihood estimation, binary choice and limited dependent variable models, and issues in time series analysis.

*Department(s):* Department of Economics and Finance

**Economic History****ECON\*6200 Economic History U [0.50]**

This course considers topics in economic history which vary from year to year. The emphasis will be usually on late-19th or 20th century topics and often involves a world emphasis. Student presentations and papers form a large part of the course.

*Department(s):* Department of Economics and Finance

**ECON\*6370 Economic Development in Historical Perspective U [0.50]**

This course will examine the experience of economic development focusing on the emergence of the Third World. Topics for discussion will vary from year to year; they may include the impact of trade expansion during the eighteenth and nineteenth centuries, the role of manufacturing as a leading sector, statist vs. the new classical approaches to government policy, and others.

*Department(s):* Department of Economics and Finance

**Money and Finance****ECON\*6320 International Finance U [0.50]**

This course deals with the theoretical policy and issues of international finance. Topics may include exchange rate determination, capital flows in international markets, the financing of trade flows, and open economy macroeconomic models and policy issues.

*Department(s):* Department of Economics and Finance

**ECON\*6380 Financial Economics U [0.50]**

This course has three objectives: (i) build a common background for all students in asset pricing and corporate finance in order to facilitate discussion of finance research; (ii) provide an in-depth look at selected finance topics, and (iii) expose students to top published research papers.

*Department(s):* Department of Economics and Finance

**ECON\*6390 Empirical Finance and Financial Econometrics U [0.50]**

This course covers topics in empirical finance, involving the integration of financial theory, financial econometrics, and data analysis. Students will learn how empirical research in finance is conducted through reading involving both textbooks and journal articles and from conducting an independent research project.

*Department(s):* Department of Economics and Finance

**ECON\*6490 Money and Banking U [0.50]**

This course studies monetary economies using overlapping generations models, MIU models and CIA models. More specifically, we will study major issues in money and banking, such as the role of money and banks, the cost of inflation, and the optimal monetary policies.

*Department(s):* Department of Economics and Finance

**ECON\*6820 Security Analysis and Portfolio Management U [0.50]**

This course has three goals: 1. to teach students how to analyze companies in the context of constructing equity portfolios. 2. to help students understand the valuation process of firms and calculate companies intrinsic value. 3. to make students aware of the role and activities of equity security analysts in highly competitive markets.

*Restriction(s):* Instructor consent required.

*Department(s):* Department of Economics and Finance

**Developmental Economics****ECON\*6350 Economic Development U [0.50]**

This course examines economic development from an international perspective: theories, history, policies and prospects.

*Department(s):* Department of Economics and Finance

**Labour Economics****ECON\*6600 Labour Economics U [0.50]**

Major themes in labour market theory including static and dynamic labour demand and supply, migration and wage structures and dynamics, unemployment, migration and the role of social programs.

*Department(s):* Department of Economics and Finance

**ECON\*6610 Topics in Labour Economics U [0.50]**

This course complements ECON\*6600. Topics include advanced issues in family labour supply, human capital, wage bargaining and contract theory, search theory, duration analysis and its application to major labour market spells such as employment and unemployment.

*Department(s):* Department of Economics and Finance

**Environmental and Resource Economics****ECON\*6800 Environmental Economics U [0.50]**

A topics course concerning the interrelationships between economic activities and the state of the natural environment. Topics may include: pollution and economic growth; energy use and environmental quality; international trade and pollution; policies for controlling pollution; techniques for assessing the benefits of environmental improvement.

*Department(s):* Department of Economics and Finance

**ECON\*6810 Economic Theory of Natural Resources Use U [0.50]**

This course examines economic models of the use of non-renewable resources to analyze issues such as resource conservation, sustainable development, taxation of resource rents, and price determination in resource markets.

*Department(s):* Department of Economics and Finance

**Other****ECON\*6300 International Trade Theory U [0.50]**

This course provides a rigorous treatment of both positive and normative aspects of trade theory through extensive use of general equilibrium models under varying assumptions. Topics may also include barriers to trade, international factor movements, growth and development, and strategic trade policy.

*Department(s):* Department of Economics and Finance

**ECON\*6400 Public Finance U [0.50]**

This course surveys the normative theory of the public sector. Topics may include public expenditure theory, tax theory, cost benefit analysis and fiscal federalism.

*Department(s):* Department of Economics and Finance

**ECON\*6650 Economics of Social Welfare U [0.50]**

This course deals with the analysis of social welfare programs, concentrating on national health insurance. It covers their structure, incentives and distribution effects, and includes empirical analysis of existing programs.

*Department(s):* Department of Economics and Finance

**ECON\*6700 Industrial and Market Organization U [0.50]**

The major topics of industrial organization are analyzed from both a game theoretic perspective and from a Structure-Conduct-Performance perspective. Typical topics include: oligopoly theory, determinants of industrial structure, Coase theorem, market entry, advertising, research and development, product differentiation, and price discrimination.

*Department(s):* Department of Economics and Finance

**ECON\*6750 Managerial Economics U [0.50]**

The course introduces students to the latest developments in the economic analysis of the inside workings and organization of firms. The course tries to explain the diversity of economic organizations, and more generally why economic activity is sometimes carried out through firms and sometimes through markets. For graduate students outside the Department of Economics and Finance.

*Department(s):* Department of Economics and Finance

**ECON\*6770 Financial Management U [0.50]**

This course examines the implications of financing decisions made by firms in a world of uncertainty. Topics such as capital budgeting, capital structure, dividend policy, market efficiency and capital asset pricing will be analyzed from the perspective of corporate finance and portfolio management theory. Co-requisite: AGEC\*6070. For graduate students outside the Department of Economics and Finance.

*Department(s):* Department of Economics and Finance

**ECON\*6930 Reading Course U [0.50]**

In some circumstances, students may arrange to take a reading course under the direction of a faculty member.

*Department(s):* Department of Economics and Finance

**ECON\*6940 Research Project U [1.00]**

All students who choose the research project option in the MA program will register in this course. Research projects are written under the direct supervision of a faculty member. Normally, research projects are completed within one or two semesters. Students must make a presentation of their work and a copy of the final report must be submitted to the Department before the final grade is submitted to the Office of Graduate Studies.

*Department(s):* Department of Economics and Finance

**ECON\*6950 Finance Research Project S [0.50]**

This program is a supervised research project exclusively for students in the Finance Specialization stream in the MA program. Students may elect either to write a major paper in a finance-related topic or to do a placement in a financial consulting company to conduct a structured portfolio analysis. Students must indicate their preference prior to the start of the summer semester to the Graduate Program Coordinator, who will oversee placements.

*Prerequisite(s):* ECON\*6000, ECON\*6140, ECON\*6380, ECON\*6820, AND  
ECON\*6930,

*Restriction(s):* For students in the MA Economics Finance Specialization

*Department(s):* Department of Economics and Finance

## Engineering

The graduate degree programs offered in the School of Engineering include a course-work MEng and research thesis programs at the MSc and PhD levels. All programs are offered as full- or part-time studies. These programs provide for specialization in five fields of study: 1) Biological Engineering 2) Environmental Engineering 3) Engineering Systems and Computing 4) Mechanical Engineering 5) Water Resources Engineering. In addition, the School of Engineering offers two graduate diploma programs: Modelling Applications in Water Resources Engineering and Engineering Design of Sustainable Water Resource Systems.

- **Biological Engineering** is broadly categorized as bio-process, food, biomedical or biomechanical engineering. Research is conducted in many areas such as: physical, chemical and thermal processing of food, biomaterials or waste; physical properties of biological materials; process control; remote sensing; medical imaging; bioinstrumentation design and the development of medical diagnostics; ergonomic and prosthetic biomechanics; design of implants and surgical tools for human and veterinary applications.
- **Environmental Engineering** involves methods to prevent or mitigate damage to the environment by the reduction, treatment, or reclamation of solid, liquid, or gaseous by-products of industrial, agricultural and municipal activities. Emphasis is on the behaviour and fate of contaminants in the environment. Recent research topics include the following: composting of organic solids; control and remediation of chemical spills; wastewater treatment; soil/site remediation technology; policy innovations; air pollution and meteorology; vapour exchange and supercritical fluid extraction; air-surface pollutant exchange measurement; bio-filtration and membrane technologies; modelling of environmental processes.
- **Engineering Systems and Computing** involves development of digital or microelectronic devices, computer or robotic technologies and their application to manufacturing, computing, mechatronic or embedded systems. Some active research areas include: soft computing and neural networks; autonomous robots; intelligent control systems; micro-electromechanical (MEMS) devices; embedded systems and special purpose computing; VLSI circuit design and layout; analog integrated circuits and system-on-chip design; integrated sensor systems and networks; digital devices and signal processing; wireless and optical communication systems; cryptographic systems.
- **Mechanical Engineering** combines individual depth of experience and competence in a particular chosen major specialty with a strong background in the basic and engineering sciences. It strives to develop professional independence, creativity, leadership, and the capacity for continuing professional and intellectual growth. To help support the objectives of graduate degree programs at Guelph, an interdisciplinary learning environment is provided. Research areas that are pertinent and in line with Guelph's vision include: sustainable energy, sustainable mobility, sustainable design, life-cycle design and assessment, systems modernization, materials and manufacturing, thermo-fluids, solid mechanics, remanufacturing, intelligent control system, closed-loop supply chain management, product life assessment and engineering management.
- **Water Resources Engineering** involves investigation, analysis and design of systems for control and utilization of land and water resources as part of the management of urban and rural watersheds. Research areas include: water quality control and safety; resource use and groundwater quality; hydrologic modelling; design and planning of urban water and sewage infrastructure; rural waste treatment systems; erosion control; non-point source pollution and mitigation; Geographic Information Systems (GIS); sediment and contaminant transport; irrigation and drainage modelling.

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#### **Richard G. Zytner**

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### **Associated Graduate Faculty**

#### **Douglas M. Joy**

BAsC Toronto, MAsC Ottawa, PhD Waterloo, P.Eng - Retired Faculty

#### **April Khademi**

BEng, MAsC Ryerson, PhD Toronto, P.Eng - Assistant Professor, Ryerson University

### **MAsC Program**

The MAsC program is intended to provide advanced training in engineering sciences, analysis, design, and research methodology. This objective is achieved through a combination of course work, applied research, and thesis writing. Upon graduation students will be able to analyse and research an engineering problem and apply their acquired skills and knowledge in a practical solution. A final examination is conducted following a public seminar presentation of the student's thesis.

### **Admission Requirements**

In addition to the general admission standards of the university, the school has adopted additional admissions criteria for MAsC studies. Applicants must meet one of the following requirements:

- Baccalaureate degree in engineering or equivalent. Applicant must be a graduate from an honours engineering program with at least a 75% average in the past four full-time semesters or the equivalent. International degree and grade equivalents will be determined by the Office of Graduate Studies.
- Bachelor of Science degree or equivalent. At least a 'B+' or 75% average in the work of the last four full-time semesters or the last two complete undergraduate years of an honours science degree. Applicants must demonstrate acceptable analytical ability by having taken a sufficient number of courses in mathematics and the physical sciences (chemistry and physics). Applicants lacking background in specific topics related to their research project must be prepared to complete make-up undergraduate engineering courses without receiving graduate credit.

### **Degree Requirements**

The prescribed program of study must consist of no fewer than 2.0 credits, of which at least 1.5 credits must be at the graduate level, and at least 1.0 must be engineering graduate courses. Under special circumstances the school may reduce the 1.5 credit course requirement; however, the 1.0 graduate-engineering-course credit requirement will not be changed. In all cases the remaining courses must be acceptable for graduate credit; that is, they must be either graduate courses or senior undergraduate courses. Depending on the student's background, the advisory committee may specify more than four courses, including undergraduate make-up courses. If make-up courses are deemed necessary, they will be considered additional courses.

### **MEng Program**

The objective of the course-work master's degree program (MEng) is to provide an opportunity for engineering graduates, usually practising engineers, to advance their understanding of engineering principles and increase their grasp of the application of these principles to the solution of complex, practical problems. Many of these students are returning to school in order to learn about recent technological developments that have occurred since graduation in their field. The objective is achieved through selecting from a number of core and elective courses and completing a major project. The project requires a final written report that is presented in a public seminar followed by an oral examination of the candidate.

### **Admission Requirements**

Applicants must be graduates of an honours engineering program with at least a 70% average in the past four full semesters or the last two complete undergraduate years or the equivalent. International degree and grade equivalents will be determined by the Office of Graduate Studies.

Applicants must demonstrate acceptable analytical ability by having taken a sufficient number of courses in mathematics, and the physical sciences.

Biological Engineering applicants must have a minimum of three of the following courses or equivalents:

- Biological/Food/Bioprocess Engineering
- Engineering Unit Operations
- Bioreactor Design
- Bioinstrumentation Design
- Food Process Engineering Design
- Digital Process Control Design
- Heat and Mass Transfer
- Process Engineering

Environmental Engineering applicants must have a minimum of three of the following courses or equivalents:

- Introduction to Environmental Engineering
- Engineering Unit Operations
- Water Quality
- Air Quality
- Solid Waste Management
- Water and Wastewater Treatment

Water Resources Engineering applicants must have a minimum of three of the following courses or equivalent:

- Fluid Mechanics
- Water Management
- Hydrology
- Water Quality
- Urban Water Systems
- Watershed Structures
- Soil and Water Conservation

Engineering Systems and Computing applicants must have a minimum of three of the following courses or equivalents:

- Electric Circuits
- Digital Systems
- Systems and Control Theory
- Programming
- Electronics
- Robotics

Mechanical Engineering applicants must have a minimum of three of the following courses or equivalents:

- Thermo-fluids
- Heat Transfer
- Solid mechanics
- Material science

- Dynamic System and controls
- Manufacturing processes
- Electrical circuits
- Machine Design
- Quality control
- Intelligent manufacturing

Applicant qualifications may be assessed via an entrance interview/oral examination conducted by the proposed advisor and one member of the School of Engineering Graduate Program Committee. Students deficient in certain areas will be required to take make-up undergraduate courses. Such students will be admitted and allowed to continue on provisional status for a maximum of two semesters or until the requirements are completed. These courses will not count toward the student's graduate credit requirements.

### Degree Requirements

The prescribed program of studies consists of at least 5.0 credits acceptable for graduate credit. This includes 2.5 credits from the program core (see the School of Engineering Graduate Handbook), and 2.5 additional credits chosen from approved courses (section 5.5 of the School of Engineering Graduate Handbook). No more than 1.0 of these credits will be for undergraduate engineering courses, as approved by the Director, and no more than 1.5 credits will be from courses offered outside the School of Engineering. For the final project course (1.0 credit), one member of the graduate faculty will be appointed by the Associate Director, Graduate Studies as an advisor.

### PhD Program

The PhD program prepares candidates for a career in engineering teaching, research, or consulting. The program is designed to provide both broad knowledge of engineering science and training in advanced research. Doctoral research carries the expectation of making an original contribution to the body of existing knowledge or technology. It is also expected that the responsibility of problem definition and solution is that of the student, and that the student's advisor acts truly in an advisory capacity. Therefore, graduates are expected to have acquired autonomy in defining and analysing problems, conducting research, and preparing scholarly publications. These objectives are achieved through a combination of course work, independent research, a qualifying examination, and the production and defence of a research dissertation.

### Admission Requirements

The minimum academic requirement for admission to the PhD program is normally a recognized Master's degree in engineering. Applicants are usually required to have completed a Bachelor's and a Master's degree from a recognized post-secondary institution and must have achieved a minimum B average in their Master's program. Applicants must also have demonstrated strong potential for research. A strong recommendation from the MASc advisor is necessary. Direct admission to the PhD program from a Bachelor's program is rarely granted. Applicants requesting direct admission must hold a bachelor's degree with exceptionally high academic standing and have related research experience. Such applicants should discuss this option with the Associate Director, Graduate Studies at the earliest opportunity.

### Degree Requirements

The prescribed program of study must consist of no fewer than 2.0 credits in addition to those taken as part of the MASc degree. At least 1.5 of the credits must be at the graduate level, and at least 1.0 must be engineering graduate courses. Under special circumstances and with the approval of the Director, the school may reduce the requirement for 1.5 credit course requirement; however the 1.0 graduate-engineering-course credit requirement will not be changed. In all cases the remaining courses must be acceptable for graduate credit; that is, they must be either graduate courses or senior undergraduate courses. Depending on the student's background, the advisory committee may specify more than four courses, including undergraduate make-up courses. If make-up courses are deemed necessary, they will be considered additional courses.

The qualifying examination as outlined in the Graduate Calendar is held by the end of the fourth semester but no later than the fifth semester after the student has completed the required courses

### Diploma Program

The objective of the graduate diploma is to provide mid-career, engineering professionals from Canada and abroad with post graduate education and training to improve their job-related expertise within an 8 month period. The program enhances the ability of these professionals to gain employment in the field of Water Resources engineering by developing specialized knowledge in one of two areas of Water Resources. The first area will emphasize higher learning in the application of Modelling in a Water Resources context. Application of existing tools, particularly GIS, to a variety of contemporary water resources problems will be emphasized. The second area focuses on the Design of Sustainable Water Resources Systems that will be sustainable in today's development environment.

### Admission Requirements

Students with an honours degree will be considered for the Graduate Diploma program provided they have satisfactory preparation in mathematical and physical sciences. A minimum average grade of 70% for the last four full-time semesters, or the last two complete undergraduate years, prior to entry will normally be required.

Since an adequate background in undergraduate engineering courses is prerequisite for courses offered in the program, there is a requirement of the following courses or equivalent.

ENGG*2230	Fluid Mechanics
ENGG*3650	Hydrology
ENGG*3340	Geographic Information Systems1

The qualification will be assessed by transcripts supplied by the student at the time of application. Students deficient in certain areas will be required to take make-up undergraduate courses as decided by the Graduate Program Committee. The student will be admitted on probation until the requirements have been completed. These courses will not count toward the student graduate degree requirement.

<sup>1</sup>Only required for students in the Modelling Applications in Water Resources Systems

### Diploma Requirements

The prescribed program consists of 2.0 credits acceptable at the graduate level.

### Modelling Applications in Water Resource Engineering

The core courses consist of a total of 2.0 credits, 1.5 credits must come from the list below. One of these must be ENGG\*6800.

ENGG*6800	[0.50]	Deterministic Hydrological Modelling
ENGG*6740	[0.50]	Ground Water Modelling
ENGG*6840	[0.50]	Open Channel Hydraulics
ENGG*6880	[0.50]	Soil Erosion and Fluvial Sedimentation
ENGG*6030	[0.50]	Finite Difference Methods
ENGG*6050	[0.50]	Finite Element Methods
ENGG*4510	[0.50]	Risk Assessment and Management
ENGG*6060	[0.50]	Engineering Systems Modelling and Simulation

In addition, the student must complete ENGG\*6910. This is a 0.5 credit, 1 semester course. This special topics course will focus on one of the following areas:

- Watershed Systems Design
- Soil-Water Conservation Systems Design
- Urban Water Systems Design

And include a project utilizing a GIS-based modeling approach.

### Engineering Design of Sustainable Water Resource Systems

The courses consist of a total of 2.0 credits. Two courses (1.0 credits) must be selected from the following courses:

ENGG*6610	[0.50]	Urban Stormwater Management
ENGG*6860	[0.50]	Stream and Wetland Restoration Design
ENGG*6840	[0.50]	Open Channel Hydraulics
ENGG*6140	[0.50]	Optimization Techniques for Engineering
ENGG*4510	[0.50]	Risk Assessment and Management
ENGG*6680	[0.50]	Advanced Water and Wastewater Treatment
ENVS*6280	[0.50]	Soil Physics
RPD*6310	[0.50]	Environmental Impact Assessment
ENGG*4250	[0.50]	Watershed Systems Design2
ENGG*4360	[0.50]	Soil-Water Conservation Systems Design2
ENGG*4370	[0.50]	Urban Water Systems Design2

In addition to the courses above, the course ENGG\*6910 must be completed. This is a 0.5 credit, one semester course. For each of these an area of emphasis from one of the following three areas<sup>3</sup> must be selected:

- Watershed Systems Design
- Soil-Water Conservation Systems Design
- Urban Water Systems Design

For this special topics course the project must focus on sustainability of water resources within the area of emphasis selected.

<sup>2</sup>Only one of these courses may be selected.

<sup>3</sup>If one of the undergraduate courses listed above are selected, the area of emphasis for this course must differ from the undergraduate course.

### Interdepartmental Programs

### MSc Food Safety and Quality Assurance

The School of Engineering participates in the MSc program in food safety and quality assurance. Those faculty members whose research and teaching expertise includes aspects of food safety and quality assurance may serve as advisors for MSc students. Please consult the Food Safety and Quality Assurance listing for a detailed description of the MSc program.

## Collaborative Specializations

### International Development Studies

The School of Engineering participates in the MEng, MASc and PhD collaborative specialization in International Development Studies (IDS). The International Development Studies collaborative specialization provides an interdisciplinary framework for the study of international development combining training in a selected academic discipline with exposure to a broad range of social science perspectives. This collaborative specialization will add the designation "International Development Studies" to your program. Applicants apply directly through the School of Engineering and must meet the University of Guelph and department program admission requirements. Students should consult the International Development Studies listing to confirm the IDS collaborative specialization requirements.

## Courses

### General

#### ENGG\*6000 Advanced Heat and Mass Transfer U [0.50]

Basic physical principles of transport phenomena. Heat and mass transfer methods for physical systems. Time and volume averaging. Dimensional analysis.

*Department(s):* School of Engineering

#### ENGG\*6010 Assessment of Engineering Risk U [0.50]

The question of "how safe is safe enough?" has no simple answer. In response, this course develops the bases by which we can assess and manage risk in engineering. Course deals with fate and transport issues associated with risk, as relevant to engineering and how these aspects are employed in the making of decisions.

*Prerequisite(s):* STAT\*2040 or STAT\*2120

*Department(s):* School of Engineering

#### ENGG\*6020 Advanced Fluid Mechanics U [0.50]

Laminar and turbulent flow. Turbulence and turbulence modelling. Boundary-layer flow. Compressible flow. Potential flow.

*Department(s):* School of Engineering

#### ENGG\*6030 Finite Difference Methods U [0.50]

Numerical solution of partial differential equations of flow through porous media; flow of heat and vibrations; characterization of solution techniques and analysis of stability; convergence and compatibility criteria for various finite difference schemes.

*Department(s):* School of Engineering

#### ENGG\*6050 Finite Element Methods U [0.50]

Boundary-value problems. Methods of approximation. Time dependent problems. Isoparametric elements. Numerical integration. Computer implementation. Mesh generation and layouts. Two-dimensional finite elements.

*Department(s):* School of Engineering

#### ENGG\*6060 Engineering Systems Modelling and Simulation U [0.50]

A study of theoretical and experimental methods for characterizing the dynamic behaviour of engineering systems. Distributed and lumped parameter model development. Digital simulation of systems for design and control.

*Department(s):* School of Engineering

#### ENGG\*6080 Engineering Seminar U [0.00]

The course objective is to train the student in preparing, delivering and evaluating technical presentations. Each student is required to: (a) attend and write critiques on a minimum of six technical seminars in the School of Engineering; and (b) conduct a seminar, presenting technical material to an audience consisting of faculty and graduate students in the school. This presentation will then be reviewed by the student and the instructor.

*Department(s):* School of Engineering

#### ENGG\*6090 Special Topics in Engineering U [0.50]

A course of directed study involving selected readings and analyses in developing knowledge areas which are applicable to several of the engineering disciplines in the School of Engineering.

*Department(s):* School of Engineering

### Biological Engineering

#### ENGG\*6110 Food and Bio-Process Engineering U [0.50]

Kinetics of biological reactions, reactor dynamics and design. Food rheology and texture; water activity and the role of water in food processing; unit operations design-thermal processing; and drying, freezing and separation processes.

*Department(s):* School of Engineering

#### ENGG\*6120 Fermentation Engineering U [0.50]

Modelling and design of fermenter systems. Topics include microbial growth kinetics, reactor design, heat and mass transfer. Instrumentation and unit operations for feed preparation and product recovery. Prerequisite: undergraduate course in each of microbiology, heat and mass transfer, and biochemistry or bioprocess engineering.

*Department(s):* School of Engineering

#### ENGG\*6130 Physical Properties of Biomaterials U [0.50]

Rheology and rheological properties. Contact stresses between bodies in compression. Mechanical damage. Aerodynamic and hydro-dynamic characteristics. Friction.

*Department(s):* School of Engineering

#### ENGG\*6150 Bio-Instrumentation U [0.50]

Instrumentation systems. Transducers. Amplifier circuits. Recording methods. Spectroscopy & colorimetry. Radiation, humidity, pH and noise measurements. Chromatography.

*Restriction(s):* ENGG\*3450 or equivalent.

*Department(s):* School of Engineering

#### ENGG\*6160 Advanced Food Engineering U [0.50]

Application of heat and mass transfer, fluid flow, food properties, and food- processing constraints in the design and selection of food process equipment. Development of process specifications for the control of the flow of heat and moisture and the associated microbial, nutritional and organoleptic change in foods. Food system dynamics and process development.

*Department(s):* School of Engineering

#### ENGG\*6170 Special Topics in Food Engineering U [0.50]

A course of directed study involving selected readings and analyses in developing knowledge areas of food engineering.

*Department(s):* School of Engineering

#### ENGG\*6180 Final Project in Biological Engineering U [1.00]

A project course in which a problem of advanced design or analysis in the area of biological engineering is established, an investigation is performed and a final design or solution is presented.

*Restriction(s):* This course is open only to students in the biological MEng program.

*Department(s):* School of Engineering

#### ENGG\*6190 Special Topics in Biological Engineering U [0.50]

A course of directed study involving selected readings and analyses in developing knowledge areas of biological engineering.

*Department(s):* School of Engineering

#### ENGG\*6300 Research Methods in Bioengineering U [0.50]

Research methodologies used in bioengineering are reviewed and assessed in the context of a diverse range of applications: biomechanics, control and instrumentation, ergonomics, diagnostic tools, biomaterials and food safety. The scientific method is discussed in terms of defining research problems, appropriate tests and hypotheses, experimental methods, data analysis and drawing conclusions. The objective is to guide students as they develop a coherent research proposal and deepen their understanding of the breadth of the discipline. (Offered in alternate years)

*Restriction(s):* Instructor consent required.

*Department(s):* School of Engineering

#### ENGG\*6440 Advanced Biomechanical Design U [0.50]

Biomechanical Design from concept through prototyping and testing. This course will investigate and apply techniques used for biomechanical design including reverse engineering, solid modelling, geometric tolerancing, testing and rapid prototyping. Instructor's signature required.

*Department(s):* School of Engineering

### Environmental Engineering

#### ENGG\*6610 Urban Stormwater Management U [0.50]

Continuous stormwater management models and model structure. Catchment discretization and process disaggregation. Pollutant build-up, wash off and transport. Flow and pollutant routing in complex, looped, partially surcharged pipe/channel networks including pond storage, storage tanks, diversion structures, transverse and side weirs, pump stations, orifices, radical and leaf gates and transient receiving water conditions (including tides). Pollutant removal in sewer networks, storage facilities and treatment plants.

*Department(s):* School of Engineering

**ENGG\*6630 Environmental Contaminants: Fate Mechanisms U [0.50]**

Analysis of fate mechanisms associated with environmental contaminants. Focus on substances which are generally considered to be hazardous to humans, or other animal life at low concentrations. Study of physicochemical properties and fate estimation on control and remediation strategies. Quantitative analysis of contaminant partitioning and mass flows, including cross-media transport and simultaneous action of contaminant fate mechanisms.

*Department(s):* School of Engineering

**ENGG\*6650 Advanced Air Quality Modelling U [0.50]**

Analysis of analytical and computational models used to predict the fate of airborne contaminants; role of air quality models for the solution of engineering-related problems; analysis of important boundary layer meteorology phenomena that influence the fate of air pollutants; conservation equations and mathematical solution techniques; model input requirements such as emissions inventories; Gaussian models; higher-order closure models; Eulerian photochemical grid models.

*Department(s):* School of Engineering

**ENGG\*6660 Renewable Energy U [0.50]**

The engineering principles of renewable energy technologies including wind, solar, geothermal and biomass will be examined, including technology-specific design, economic and environmental constraints. Students will compare the relative merits of different energy technologies and gain a knowledge base for further study in the field.

*Restriction(s):* Engineering graduate students. Instructor consent required.

*Department(s):* School of Engineering

**ENGG\*6670 Hazardous Waste Management U [0.50]**

This course will define the different types of hazardous wastes that currently exist and outline the pertinent legislation governing these wastes. Information will be presented on different ways to handle, treat and dispose the hazardous waste, including separation, segregation, minimization, recycling and chemical, physical, biological, and thermal treatment. Also to be discussed are hazardous waste landfills and site remediation technologies. Specifics include design and operation of hazardous landfill sites, handling and treatment of leachate, comparison of pertinent soil remediation technologies. Case studies will be reviewed.

*Department(s):* School of Engineering

**ENGG\*6680 Advanced Water and Wastewater Treatment U [0.50]**

This design course will discuss advanced technologies not traditionally covered during an undergraduate curriculum. An important consideration will be the reuse of water.

*Department(s):* School of Engineering

**ENGG\*6790 Special Topics in Environmental Engineering U [0.50]**

A course of directed study involving selected readings and analyses in developing knowledge areas of environmental engineering.

*Department(s):* School of Engineering

**ENGG\*6950 Final Project in Environmental Engineering U [1.00]**

A project course in which a problem of advanced design or analysis in the area of environmental engineering is established, an investigation is performed and a final design or solution is presented.

*Restriction(s):* This course is only open to students in the environmental MEng program.

*Department(s):* School of Engineering

**Engineering Systems and Computing****ENGG\*6070 Medical Imaging U [0.50]**

Digital image processing techniques including filtering and restoration; physics of image formation for such modalities as radiography, MRI, ultrasound.

*Prerequisite(s):* ENGG\*3390 or equivalent

*Department(s):* School of Engineering

**ENGG\*6100 Machine Vision U [0.50]**

Computer vision studies how computers can analyze and perceive the world using input from imaging devices. Topics covered include image pre-processing, segmentation, shape analysis, object recognition, image understanding, 3D vision, motion and stereo analysis, as well as case studies.

*Department(s):* School of Engineering

**ENGG\*6140 Optimization Techniques for Engineering U [0.50]**

This course serves as a graduate introduction into combinatorics and optimization. Optimization is the main pillar of Engineering and the performance of most systems can be improved through intelligent use of optimization algorithms. Topics to be covered: Complexity theory, Linear/Integer Programming techniques, Constrained/Unconstrained optimization and Nonlinear programming, Heuristic Search Techniques such as Tabu Search, Genetic Algorithms, Simulated Annealing and GRASP.

*Department(s):* School of Engineering

**ENGG\*6450 Queueing Theory & Traffic Modeling in Data Networks U [0.50]**

Network traffic modeling. Transient and steady-state analysis of Markov chains. Queueing analysis. Admission and access control. Flow control protocols. Congestion control. End-to-end performance bounds analysis.

*Restriction(s):* Engineering graduate students. Instructor consent required.

*Department(s):* School of Engineering

**ENGG\*6500 Introduction to Machine Learning U [0.50]**

The aim of this course is to provide students with an introduction to algorithms and techniques of machine learning particularly in engineering applications. The emphasis will be on the fundamentals and not specific approach or software tool. Class discussions will cover and compare all current major approaches and their applicability to various engineering problems, while assignments and project will provide hands-on experience with some of the tools.

*Department(s):* School of Engineering

**ENGG\*6510 Analog Integrated Circuit Design U [0.50]**

In this course, operating principles and design techniques of analog integrated circuits are introduced with emphasis on device and system modelling. These circuits include analog and switched-capacitor filters, data converters, amplifiers, oscillators, modulators, circuits for communications, sensor readout channels, and circuits for integrated memories. It is recommended that students are familiar with the fundamentals of linear systems, circuit analysis, and electronic devices.

*Department(s):* School of Engineering

**ENGG\*6520 VLSI Digital Systems Design U [0.50]**

This course will introduce the principles of VLSI MOSFET digital design from a circuit and system perspective. Advanced topics include: power issues related to each level of design abstraction; voltage and frequency scaling; power to speed tradeoffs; ASIC digital design flow; Verilog integration/integration; ASIC case studies. It is recommended that students are familiar with the fundamentals of digital circuits and electronic devices.

*Department(s):* School of Engineering

**ENGG\*6530 Reconfigurable Computing U [0.50]**

This course serves as a graduate introduction into reconfigurable computing systems. It introduces students to the analyses, synthesis and design of embedded systems and implementing them using Field Programmable Gate Arrays. Topics include: Programmable Logic devices, Hardware Description Languages, Computer Aided Design Flow, Hardware Accelerators, Hardware/Software Co-design techniques, Run Time Reconfiguration, High Level Synthesis. It is recommended that students are familiar with the fundamentals of digital design and hardware description languages.

*Department(s):* School of Engineering

**ENGG\*6540 Advanced Robotics U [0.50]**

This course is intended for graduate students who have some knowledge and interest in robotics. The course covers modelling, design, planning control, sensors and programming of robotic systems. In addition to lectures, students will work on a term project in which a problem related to robotics systems will be studied. Instructors signature required.

*Department(s):* School of Engineering

**ENGG\*6550 Intelligent Real-Time Systems U [0.50]**

Soft real-time systems, hard real-time systems, embedded systems, time handling and synchronization, deadlines, preemption, interruption, RTS languages, RTS/ operating systems, system life-cycle, petri nets, task scheduling and allocation, fault-tolerance, resource management, RTS/search techniques, dealing with uncertainty.

*Department(s):* School of Engineering

**ENGG\*6560 Advanced Digital Signal Processing U [0.50]**

Discrete-time signals and systems, z transform, frequency analysis of signals and systems, fourier transform, fast fourier transform, design of digital filters, signal reconstruction, power spectrum estimation.

*Department(s):* School of Engineering

**ENGG\*6570 Advanced Soft Computing U [0.50]**

Neural dynamics and computation from a single neuron to a neural network architecture. Advanced neural networks and applications. Soft computing approaches to uncertainty representation, multi-agents and optimization.

*Prerequisite(s):* ENGG\*4430 or equivalent

*Department(s):* School of Engineering

**ENGG\*6580 Advanced Control Systems U [0.50]**

This course will start with state space analysis of multi-input multi-output control systems. Then state space design will be presented. After that, nonlinear control systems and soft computing based intelligent control systems will be studied. Finally, hybrid control systems, H infinite control and uncertainty and robustness in control systems will be addressed.

*Department(s):* School of Engineering

**ENGG\*6590 Final Project in Engineering Systems and Computing U [1.00]**

A project course in which a problem of advanced design or analysis in the area of Engineering Systems and Computing is established by the student, an investigation is performed, and a report on the final design or solution selected is presented.

*Restriction(s):* This course is only open to students in the engineering systems and computing MEng program.

*Department(s):* School of Engineering

**ENGG\*6600 Special Topics in Engineering Systems and Computing U [0.50]**

A course of directed study involving selected readings and analyses in developing knowledge areas of Engineering Systems and Computing.

*Department(s):* School of Engineering

**Mechanical Engineering****ENGG\*6290 Special Topics in Mechanical Engineering U [0.50]**

A course of directed study involving selected readings and analyses in developing knowledge areas of mechanical engineering.

*Department(s):* School of Engineering

**ENGG\*6310 Advanced Electromechanical Devices U [0.50]**

Course covers: switched reluctance motor, brushless motor, linear motor, axial flux motor, and harmonic drive motor with applicable actuators. Other topics introduced include: Electromagnetic micro power generation, design and analysis of cooling systems and control mechanism. Background in electromagnetism required. (Offered in alternate years)

*Department(s):* School of Engineering

**ENGG\*6320 Advanced Topics in Mechatronics U [0.50]**

This course covers materials related to mechatronics systems in terms of dynamics, control, sensing, estimation. The course covers advanced topics in these areas and provides students the tools to model, analyze, and control these systems. The focus is on vehicles and robots (mobile robots).

*Department(s):* School of Engineering

**ENGG\*6340 Bioenergy and Biofuels U [0.50]**

Theoretical and hands-on experience in bio-renewable energy areas prepares students from diverse backgrounds for a career in the biorefinery industry, academia, or entrepreneurial endeavors. Also deals with the technologies of converting biomass into upgraded energy, value added products, fuels, and chemicals. Thermodynamics background helpful.

*Department(s):* School of Engineering

**ENGG\*6350 Flow Induced Vibrations U [0.50]**

Course covers fluid-structure interaction problems with an emphasis on analytical and numerical methods. Topics include vortex and turbulence induced vibration, galloping and flutter, fluid-elastic instability, and acoustic resonance. Various case studies and applications will be discussed. Background in fluid mechanics and vibrations required. (Offered in alternate years)

*Department(s):* School of Engineering

**ENGG\*6360 Fuel Cell Technology U [0.50]**

Examination of principles governing fuel cell technology and the technical challenges associated with developing fuel cell systems. Topics include the chemical thermodynamics and electrochemical kinetics of fuel cells, the evolution of fuel cell technology, and fuel cell system design. Background in materials and thermodynamics required.

*Department(s):* School of Engineering

**ENGG\*6370 Heat Transfer in Porous Media U [0.50]**

Course covers general conservation equations for studying the flow and heat transfer through porous media. Application and case studies of porous materials will be discussed. Modelling techniques will be shown for a particular application area. Background in Heat Transfer required. (Offered in alternate years)

*Department(s):* School of Engineering

**ENGG\*6380 Simulation Analysis of Discrete Event Systems U [0.50]**

Many complex engineering, operations, and business systems can be modeled as discrete-event systems. Efficient management and operation of these systems requires simulation to study their performance. Case studies and applications will be presented and discussed. (Offered in alternate years)

*Department(s):* School of Engineering

**ENGG\*6390 Final Project in Mechanical Engineering U [1.00]**

A project course in which a problem of advanced design or analysis in the area of mechanical engineering is established, an investigation is performed and a final design or solution is presented.

*Restriction(s):* This course is only open to students registered in the School of Engineering

*Department(s):* School of Engineering

**Water Resources Engineering****ENGG\*6740 Ground Water Modelling U [0.50]**

Introduction to current groundwater issues, definition of terms, review of fundamental equations describing fluid and contaminant transport in saturated groundwater zones. Mathematical techniques (analytical, FE and FD) for the solution of the fundamental equations. Application of numerical groundwater models to a variety of situations. Case studies. Review of groundwater models used in industry.

*Department(s):* School of Engineering

**ENGG\*6800 Deterministic Hydrological Modelling U [0.50]**

Deterministic hydrological models. Function of watershed models for hydraulic design, environmental assessment, operation of water control structures, flood warning. Calculation algorithms.

*Department(s):* School of Engineering

**ENGG\*6820 Measurement of Water Quantity and Quality U [0.50]**

This course covers techniques used to measure rates of movement and amounts of water occurring as precipitation, soil water, ground water and streamflow. Available measurements of water quality are surveyed. Calculation procedures involved in the use of indirect indicators of water quantity and quality individually and in combination are described.

*Department(s):* School of Engineering

**ENGG\*6840 Open Channel Hydraulics U [0.50]**

Basic concepts, energy principle; momentum principle; flow resistance; non-uniform flow; channel controls and transitions; unsteady flow; flood routing.

*Department(s):* School of Engineering

**ENGG\*6860 Stream and Wetland Restoration Design U [0.50]**

Explores the multi-disciplinary principles of stream and wetland restoration and the tools and techniques for restoration design. Restoration design is approached from a water resources engineering perspective with emphasis on hydrological and hydraulic techniques. Numerous case studies are examined as a means to identify more successful design approaches.

*Prerequisite(s):* ENGG\*3650 or equivalent.

*Department(s):* School of Engineering

**ENGG\*6880 Soil Erosion and Fluvial Sedimentation U [0.50]**

Students will be able to (i) describe processes related to soil erosion by water, (ii) describe processes related to fluvial sedimentation, (iii) evaluate and prescribe structural and non-structural control methods, and (iv) run at least one soil erosion/fluvial sedimentation computer model if the course is satisfactorily completed.

*Department(s):* School of Engineering

**ENGG\*6900 Final Project in Water Resources Engineering U [1.00]**

A project course in which an advanced design problem in the area of watershed engineering is established, a feasibility investigation performed and a final design presented.

*Restriction(s):* This course is open only to students in the water resources MEng program.

*Department(s):* School of Engineering

**ENGG\*6910 Special Topics in Water Resources Engineering U [0.50]**

A course of directed study involving selected readings and analyses in developing knowledge areas of water resources engineering.

*Department(s):* School of Engineering

## English

The English MA program in the School of English and Theatre Studies is designed to provide students with an intensive introduction to graduate-level work in English studies, within a flexible program. Students can draw on the program's strengths in the following fields:

- Studies in Canadian Literatures
- Colonial, Postcolonial and Diasporic Studies
- Early Modern Studies
- Sexuality and Gender Studies
- Transnational Nineteenth-Century Studies.

Students can also pursue a wide range of research topics in consultation with faculty members actively engaged with the literatures of different historical periods and geographical locations, and with current debates in such areas as critical theory, cultural studies, gender studies, and queer theory.

### Administrative Staff

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#### Sandra Singer

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#### J.R. (Tim) Struthers

BA, MA, PhD Western Ontario - Associate Professor

#### Ann Wilson

BA, MA, PhD York - Associate Professor and Director

### MA Program

The English MA program in the School of English and Theatre Studies is designed to provide students with an intensive introduction to graduate-level work in English studies, within a flexible program. Students can draw on the program's strengths in the following fields: 1) studies in Canadian literatures; 2) colonial, postcolonial and diasporic studies; 3) early modern studies; 4) sexuality and gender studies; and 5) transnational nineteenth-century studies. Students can also pursue a wide range of research topics in consultation with faculty members actively engaged with the literatures of different historical periods and geographical locations, and with current debates in such areas as critical theory, cultural studies, gender studies, and queer theory.

### Admission Requirements

The normal requirement for admission to the English MA program is the equivalent of an Honours degree in English studies from a recognized institution with at least 78% or higher in the last two years of study. Students with degrees with excellent academic records in other disciplines will also be considered. Successful applicants will be admitted in the Fall Semester, the Program's only entry point. Program offices should be consulted for admission deadlines. If the applicant's first degree was completed in a country where English is not the first language, English-language proficiency must be documented at the time of application.

### Degree Requirements

Students enrol in one of two study options: 1) course work and major research project, or 2) thesis.

### Course Work and Major Research Project (MRP)

Students complete six courses (6 x 0.50 credit); plus ENGL\*6803 Research Project.

### Thesis

Students complete four courses (4 x 0.50 credit); plus a thesis of 20,000 to 25,000 words (80-100 pages).

### Collaborative Specializations

The English program participates in the International Development Studies (IDS) collaborative specialization. Please consult the International Development Studies listing for a detailed description of the collaborative specialization including the special additional requirements for each of the participating departments.

### Courses

#### Note

The content of the courses listed below will vary according to the research interests of the faculty involved in offering the course. Specific course descriptions for a particular offering of the course will be available from the Graduate Program Coordinator one year in advance of the course being offered.

#### ENGL\*6002 Topics in the History of Criticism U [0.50]

This course deals with various aspects of the field of literary criticism, focusing on a specific problem or question each time it is offered. Topics may include the investigation of a specific critical debate - the debate between the Ancients and the Moderns, for instance - or the various ways in which a particular concept - such as didacticism or intentionality - has been treated or is being treated in literary studies.

*Department(s):* School of English and Theatre Studies

#### ENGL\*6003 Problems of Literary Analysis U [0.50]

Variable in content and practical in orientation this course seeks to familiarize the student with particular critical techniques and approaches by applying specific examples of those approaches and methods to particular topics (e.g., cultural studies and renaissance literature, discourse analysis and the Victorian novel, computer-mediated analysis and the theatre of the absurd).

*Department(s):* School of English and Theatre Studies

#### ENGL\*6201 Topics in Canadian Literature U [0.50]

A course to be offered at least once every academic year. This course in Canadian Literature may focus on cross-genre study or on single genres such as poetry, biography, the short story, literary memoir and/or autobiography, and poetic prose. The focus may be on such topics as the literary and general cultural production of a time-period, an age group (such as children's literature), or a specific region (such as Atlantic Canada, the Prairies, or the West Coast), or may bring together texts from two or more categories to allow for a comparative study. Other possible topics include: post-modernism and the creation of an ex-centric Canadian canon; multiculturalism and the transcultural aesthetics of Canadian writing; the construction and reinvention of a national identity and literature; and literary history, influence, reception and critique.

*Department(s):* School of English and Theatre Studies

**ENGL\*6209 Topics in Colonial, Postcolonial and Diasporic Literature U [0.50]**

A course to be offered at least once every academic year. A comparative study of postcolonial literatures in English. Topics may include a focus on a single area, such as India, the Caribbean, Africa, Australia, or New Zealand or may focus on the comparative study of some of these literatures, considering the construction of Third World, diasporic, or settler-invader colonies, or writing and reading practices in colonial, neo-colonial, and postcolonial environments.

*Department(s):* School of English and Theatre Studies

**ENGL\*6412 Topics in Medieval/Renaissance Literature U [0.50]**

An examination of the literature of Britain in the medieval and/or early modern periods. Topics may focus on a single author, a specific genre, or relationships between the literary and the cultural.

*Department(s):* School of English and Theatre Studies

**ENGL\*6421 Topics in Eighteenth Century and Romantic Literature U [0.50]**

A examination of the literature of Britain between the 17th century and the latter part of the 18th century. Topics may focus on a single author, a specific genre, or relationships between the literary and the cultural.

*Department(s):* School of English and Theatre Studies

**ENGL\*6431 Topics in Nineteenth Century Literature U [0.50]**

This course is a study of the literature of Britain, Canada, the United States, or another region from the late 18th century until the start of the First World War. Topics may focus on a single author, a specific genre, or a central critical question.

*Department(s):* School of English and Theatre Studies

**ENGL\*6441 Topics in Modern British Literature U [0.50]**

A study of the literature of Britain in the twentieth century. This course includes a consideration of the interaction between literature and culture in the period - sometimes through the examination of a specific author, sometimes through the study of a particular genre or issue.

*Department(s):* School of English and Theatre Studies

**ENGL\*6451 Topics in American Literature U [0.50]**

Topics may include a focus on a single region, such as the American West, on a single time period, such as the Civil War, on a specific genre, such as the novels of frontier women, or other issues in American literary studies.

*Department(s):* School of English and Theatre Studies

**ENGL\*6611 Topics in Women's Writing U [0.50]**

In the past the course has dealt with Victorian women poets, with the place of women in the literature of the American West, and with other issues of interest to students of women's writing and the broader issues of feminist theory.

*Department(s):* School of English and Theatre Studies

**ENGL\*6621 Topics in Children's Literature U [0.50]**

Past offerings have involved a focus on a specific author - such as Lucy Maud Montgomery - or on a specific kind of writing for or by children.

*Department(s):* School of English and Theatre Studies

**ENGL\*6641 Topics in Scottish Literature U [0.50]**

Courses under this rubric are concerned with the various literatures produced by Scots both within and beyond the boundaries of Scotland. The course could involve the study of a specific genre, the investigation of a specific theme, or the examination of a particular author over the course of her/his career.

*Department(s):* School of English and Theatre Studies

**ENGL\*6691 Interdisciplinary Studies U [0.50]**

Designed to provide the opportunity to explore alternative fields and modes of critical inquiry, this variable-content course will study the relationship between literary study and other forms of intellectual inquiry such as the relationship between literature and sociology, between critical theory and psychology, between literary history and historical fact.

*Department(s):* School of English and Theatre Studies

**ENGL\*6801 Reading Course I U [0.50]**

An independent study course, the nature and content of which is agreed upon between the individual student and the person offering the course. Subject to the approval of the student's advisory committee and the graduate program committee.

*Department(s):* School of English and Theatre Studies

**ENGL\*6802 Reading Course II U [0.50]**

An independent study course, the nature and content of which is agreed upon between the individual student and the person offering the course. Subject to the approval of the student's advisory committee and the graduate program committee.

*Department(s):* School of English and Theatre Studies

**ENGL\*6803 Research Project U [1.00]**

An independent study course, the content of which is agreed upon between the individual student and the person offering the course. Subject to the approval of the student's advisory committee and the Graduate Program Committee. This course is designed to provide the student with the opportunity to conduct an extended research project that, while not as complex or as extensive as a thesis, still provides the student with training in research methodology.

*Department(s):* School of English and Theatre Studies

**ENGL\*6811 Special Topics in English U [0.50]**

Depending on the research interests of the instructor, courses under this rubric explore topics in the study of literature that do not fall neatly under the rubrics above. In the past the course has dealt with literature and aging, and with issues in the field of popular culture.

*Department(s):* School of English and Theatre Studies

## Environmental Sciences

The School of Environmental Sciences offers program of study leading to MSc, MES, PhD, and Graduate Diploma degrees. Graduate Studies in the Environmental Sciences programs are designed to train people to work independently and imaginatively with a high level of technical skill and scientific acumen. It is expected that the graduates of the SES program will provide leadership in research and training in academic, government, and industrial sectors of society and who will participate in the formulation and implementation of constructive national and international science policy.

The PhD program has three fields of specialization: 1) earth and atmospheric sciences; 2) ecosystem science and biodiversity; and 3) plant and environmental health.

- Earth and Atmospheric Sciences – Research areas include: soil biology and soil physics, sedimentology, geobiology, soil chemistry, geochemistry, micrometeorology and air quality, soil and land resource management
- Ecosystem Science and Biodiversity – Research areas include: toxicology, pest management, management of agroecosystems, microbiology, forest systems, agroforestry, climate change biology, ecology, and insect systematics and taxonomy
- Plant & Environmental Health – Research areas include: plant biology, plant pathology, epidemiology, soil-plant interactions, biotechnology, molecular biology, forest systems, agroforestry, and climate change biology

### Administrative Staff

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#### R. Paul Voroney

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### Associated Graduate Faculty

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**Andrew VanderZaag**

BSc Guelph, PhD Dalhousie - Research Scientist, Agriculture and Agri-Food Canada

**Susan Weir**

BSc, PhD Guelph - Senior Microbiologist, Ontario Ministry of the Environment

**MSc Program**

The objective of the MSc program is to develop and train graduate students that possess a high level of knowledge about the field of environmental science, expertise in specific aspects of environmental science (their thesis research focus), training in laboratory and field techniques, and excellence in writing and oral communication. With these skills, MSc students will possess a strong foundation on which they can be highly successful in science-related positions in government, industry, and consulting, or carry out high quality research at the PhD level.

**Admission Requirements**

The School's admission standard for the MSc program is the same as the University and requires a four-year, honours science degree with a minimum B- (70-72%) average during the final two years (4 semesters) of full time undergraduate study. Meeting the minimum requirement (B-) does not guarantee entrance; depending on other criteria (e.g., letters of reference, standardized test scores, academic background relevant to the area to which the applicant has applied, degree of work experience in related fields of study) students may be considered for admission with provisional status. Students on provisional status must obtain a "B" average (70%) in at least two graduate courses during their first two semesters of study to continue in the program. Provisional students will be funded at the same level as regular students.

**Degree Requirements**

The MSc thesis program requires:

- At least 1.5 graduate course credits, including one mandatory 0.50 credit course (Research Seminar in Environmental Sciences).
- Completion and defense of a thesis on research carried out under the direct supervision of a core faculty member.

The thesis and the oral defense of the thesis are evaluated on a pass/fail basis. An acceptable MSc thesis consists of a defensible account of the student's research. The project is expected to represent a well-defined research problem, or hypothesis, and should be planned such that the clarity of the underlying rationale, the appropriateness of the technical approach, the research, and the critical evaluation of the results could normally be completed and the thesis defended within six semesters.

**MES Program**

The MES (coursework Master's) degree enables students to study the most recent theoretical and technical advances in the environmental sciences through multidisciplinary teaching and research. There are two options to the MES in Environmental Sciences: by coursework + research project and by coursework-only. The MES will promote critical thinking and enhance oral and written communication skills so that graduates can excel in industry, government and other sectors of civil society (e.g., environmental risk assessors/managers, political advisors on policy/law issues in government, senior positions in national and international agencies, etc.).

**Admission Requirements**

The School's admission standard for the MES program is the same as the University and requires a four-year, honours science degree with a minimum B- (70-72%) average during the final two years (4 semesters) of full time undergraduate study. Meeting the minimum requirement (B-) does not guarantee entrance; depending on other criteria (e.g., letters of reference, standardized test scores, academic background relevant to the area to which the applicant has applied, degree of work experience in related fields of study) students may be considered for admission with provisional status. Students on provisional status must obtain a "B" average (70%) in at least two graduate courses during their first semester of study to continue in the program. Provisional students will be funded at the same level as regular students

**MES Degree Requirements****Course Work and Major Research Project (MRP)**

Candidates must complete a minimum of 4.0 credits

- ENVS\*6500 [1.0] The Environmental Science Research Project
- ENVS\*6501 F [0.5] Advanced Topics in Environmental Science
- ENVS\*6502 W [0.5] Seminar in Environmental Science
- Two additional credits from Environmental Sciences courses

The research project may be completed at the University or as part of a placement with an approved non-academic agency. The project may include analysis of a data set (derived from lab, field, or computer simulation) related to the specialization chosen by the student including analyses and interpretations of relevant data (the student may or may not be involved in collecting the data), or major, critical literature review. The outcome of the research project will be a written report and a seminar presented to the department.

**Course Work**

Candidates must complete a minimum of 4.0 credits

- ENVS\*6501 F [0.5] Advanced Topics in Environmental Science

- ENVS\*6502 W [0.5] Seminar in Environmental Science
- Three additional credits from Environmental Sciences courses

Students in either option may select courses from other departments on campus but are advised that access may be restricted and permission may be required by course instructors. A maximum of 1.0 credits may be taken from senior undergraduate courses, with permission of the Graduate Coordinator.

**PhD Program**

The PhD is offered in the following fields: 1) earth and atmospheric sciences; 2) ecosystems science and biodiversity; and 3) plant and environmental health. The objectives of the PhD program are to develop highly competent, independent, creative, and critical scientists. Doctoral students of the SES graduate program will provide leadership as scholars in academic institutions, as managers and officers in the industrial research and development sector, research and policy branches within the government sector and in other social institutions. Research in the PhD program is expected to be original and novel, contribute significantly to the relevant research field, and published in high-quality peer-reviewed journals.

**Admission Requirements**

Admission to the PhD program is generally restricted to students with a recognized MSc degree in a related field obtained with a minimum academic standing of "A-" (≥80%) in their postgraduate studies. Students who meet the minimum University requirement (73-76%) but not the School requirement (≥80%) may be considered depending on other criteria (e.g., letters of reference, standardized test scores, academic background relevant to the area to which the applicant has applied, degree of work experience in related field of study) for admission with provisional status. Students on provisional status must obtain an "A-" (≥80%) average in at least two graduate courses during their first two semesters of study to continue in the program. Provisional students will be funded at the same level as regular students. In exceptional cases, students may enter the PhD program directly from a BSc (Hons) if they have the minimum requirements as defined by the Office of Studies, University of Guelph.

**Degree Requirements**

The PhD program requires:

- Completion of one mandatory 0.50 credit course (Research Seminar in Environmental Sciences).
- Successful completion of a qualifying exam within five semesters of first registration in the program
- Successful defense of a thesis describing original research, carried out under the direct supervision of a core faculty member.

In the PhD program, the qualifying exam, thesis and the oral defense of the thesis are evaluated on a pass/fail basis. An acceptable PhD thesis consists of an authoritative report of the student's research. The project is expected to represent a well-defined research problem, or hypothesis, and should be planned such that the research could normally be completed and the thesis defended in nine semesters (12 semesters for those students transferring from the MSc program). The research described in the thesis must represent a significant contribution to knowledge in that field. Emphasis is therefore placed on the quality of the presentation, maturity in scholarship, breadth and depth of the work, and critical judgement. Successful completion of the PhD thesis occurs when the research is judged to be sufficiently meritorious to warrant publication in reputable, peer-reviewed journals in its field. PhD students are normally expected to have published, or have "in-press", one or more papers in peer-reviewed journals prior to the defense. In cases involving intellectual property, it is recognized that publication may not always be immediately possible. In such cases, a Pass will require that the committee is satisfied that, in their opinion, the work is of sufficient quality and originality that it would meet the standards for peer-reviewed publications.

**Collaborative Specializations****International Development Studies**

The School of Environmental Sciences participates in the MSc collaborative specialization in International Development Studies.

Please consult the International Development Studies listing for a detailed description of this collaborative specialization.

**Toxicology**

The School of Environmental Sciences participates in the MSc/PhD collaborative specialization in toxicology. The faculty members' research and teaching expertise includes aspects of toxicology; they may serve as advisors for MSc and PhD students.

Please consult the Toxicology listing for a detailed description of the MSc/PhD collaborative specialization.

## Courses

<b>ENVS*6000 Physical Environment of Crops and Forests F [0.50]</b>
Recent literature on temperature, humidity, radiation, wind, gases and particles in crop and forest environments; evapotranspiration and photosynthesis of plant communities; modification of microclimates; applied micrometeorology. <i>Offering(s):</i> Offered in even-numbered years. <i>Department(s):</i> School of Environmental Sciences
<b>ENVS*6050 Micrometeorology W [0.50]</b>
Exchanges of mass, momentum and energy between the surface and the atmosphere will be studied in the context of larger-scale meteorology. Diffusion and turbulence in and above plant canopies will be examined from theoretical and practical perspectives. Topics include time-series analysis, micrometeorological measurement theory, and basic principles of atmospheric science. <i>Offering(s):</i> Offered in even-numbered years. <i>Department(s):</i> School of Environmental Sciences
<b>ENVS*6060 Meteorological Instrumentation W [0.50]</b>
Theoretical and practical aspects of electronic circuits, sensors, and equipment used in meteorological research. <i>Prerequisite(s):</i> ENVS*4210 or equivalent <i>Department(s):</i> School of Environmental Sciences
<b>ENVS*6190 Environmental Microbial Technology U [0.50]</b>
Current topics in selected areas of environmental microbial technology. An emphasis will be placed on the physiology and genetics of microorganisms useful in environmental biotechnology. The course involves extensive use of current journal articles. <i>Restriction(s):</i> Undergraduate degree in microbiology or related discipline. <i>Department(s):</i> School of Environmental Sciences
<b>ENVS*6242 Special Topics in Atmospheric Science F,W,S [0.50]</b>
Students will explore topics within atmospheric science such as climatology, animal biometeorology, air pollution meteorology, and hydrometeorology. Normally, an independent course of study will be developed with a faculty advisor and one or more students in the semester prior to enrollment. Occasionally, the course will be offered as a lecture/seminar in a particular area, to be advertised in the semester prior to offering. Typically, students will produce a major paper or scientific report. <i>Restriction(s):</i> Instructor consent required. <i>Department(s):</i> School of Environmental Sciences
<b>ENVS*6280 Soil Physics W [0.50]</b>
The soil as a physical system with special regard to soil water movement and the diffusion and dispersion of chemical substances. Numerical techniques and computer solutions will be developed. <i>Department(s):</i> School of Environmental Sciences
<b>ENVS*6340 Colloquium in Insect Systematics W [0.25]</b>
Weekly discussions and seminars dealing with current topics in systematic entomology. <i>Offering(s):</i> Offered in odd-numbered years. <i>Department(s):</i> School of Environmental Sciences
<b>ENVS*6350 Soil Organic Matter and Biochemistry F [0.50]</b>
(1) Soil organic matter characterization, (2) dynamics of soil organic matter, (0.5) nutrient cycling. <i>Offering(s):</i> Offered in odd-numbered years. <i>Department(s):</i> School of Environmental Sciences
<b>ENVS*6360 Soil and Water Chemistry F [0.50]</b>
Thermodynamics of soil solutions; solution-solid phase equilibria; reaction kinetics; computer modelling of solute-mineral interactions. <i>Department(s):</i> School of Environmental Sciences
<b>ENVS*6400 Soil Nitrogen Fertility and Crop Production W [0.50]</b>
Emphasis will be placed on soil N transformations and processes, and N sources for crops; field experimentation methods; environmental issues. <i>Department(s):</i> School of Environmental Sciences
<b>ENVS*6440 Field Sampling Strategies and Geostatistics W [0.50]</b>
Concepts and practical aspects of collecting, synthesizing and interpreting data from spatially and temporally variable and/or correlated fields. Hands-on experience in describing spatial structure of large data sets (supplied by student or instructor) using available software. <i>Offering(s):</i> Offered in even-numbered years. <i>Department(s):</i> School of Environmental Sciences

<b>ENVS*6452 Special Topics in Ecosystem Science and Biodiversity F,W,S [0.50]</b>
Students will explore topics within ecosystem science such as terrestrial ecology, forest science, aquatic systems and environmental biology. Normally, an independent course of study will be developed with a faculty advisor and one or more students in the semester prior to enrollment. Occasionally, the course will be offered as a lecture/seminar in a particular area, to be advertised in the semester prior to offering. Typically, students will produce a major paper or scientific report. <i>Restriction(s):</i> Instructor consent required. <i>Department(s):</i> School of Environmental Sciences
<b>ENVS*6460 Environmental Remediation W [0.50]</b>
This course will discuss environmental remediation topics including, but not limited to, using plants, microorganisms and substrates (e.g., soil and engineered materials) to improve air, water and soil quality. For example, this course will explore the current sciences and technologies of living walls to improve indoor air quality, green roofs to manage storm water and air pollutants, and constructed wetlands to treat wastewater. Environmental remediation is, by nature, multidisciplinary, involving chemistry, physics, biology, engineering, landscape design, etc. <i>Department(s):</i> School of Environmental Sciences
<b>ENVS*6470 The Science and Management of Multiple Stressors in the Great Lakes F [0.50]</b>
In this two-week lecture-field course, students will learn about historical and current environmental issues affecting the Great Lakes basin from the perspective of multiple stressors and their cumulative impacts. The importance of linking science and policy, and the role important of governments, are emphasized. <i>Restriction(s):</i> Instructor consent required. <i>Department(s):</i> School of Environmental Sciences
<b>ENVS*6500 Environmental Sciences Research Project U [1.00]</b>
A concise, critical review of an area of study related to the field chosen by the student including analyses and interpretation of relevant data. The project will be written in the form of a scientific paper and presented to the department as a seminar. <i>Restriction(s):</i> Available only to students registered in the Environmental Sciences: MES program. <i>Department(s):</i> School of Environmental Sciences
<b>ENVS*6501 Integrating Science and Policy in Environmental Science F [0.50]</b>
A case-study approach, based on current and historical issues, and involving presentations from faculty, professionals and students, will be used to develop an advanced understanding of current issues in the environmental sciences, including examination of the underlying science and management of the issues, and the effectiveness of associated policies. <i>Restriction(s):</i> Preference will be given to students in the MES.ENVS:L. <i>Department(s):</i> School of Environmental Sciences
<b>ENVS*6502 Seminar in Environmental Sciences W [0.50]</b>
This course will provide an interactive and critical forum for students to participate in an advanced discussion and debate on current environmental issues, and to learn about the practical skill set(s) required by various employment sectors in solving these issues. <i>Restriction(s):</i> Instructor consent required. Preference will be given to students in the MES program. <i>Department(s):</i> School of Environmental Sciences
<b>ENVS*6503 Biogeochemistry of Wetlands S [0.50]</b>
This course is focused on the role of wetlands in maintaining healthy ecosystems and in controlling contaminant fluxes to water. Lectures complement field and laboratory assessments of wetlands to understand element biogeochemical cycles in these transitional environments. The course includes field trips to Ontario wetlands. <i>Restriction(s):</i> Preference will be given to students in MES.ENVS:L, MSc.ENVS and PhD.ENVS <i>Department(s):</i> School of Environmental Sciences
<b>ENVS*6505 Soil Survey and Interpretation S [0.50]</b>
Students will learn concepts, techniques and analysis related to the characterization of soil in the landscape. Focus will be given to soilscapes encountered in southern Ontario. Course involves multiple field excursions to examine the distribution of soils in this region. <i>Restriction(s):</i> Preference will be given to students in MES.ENVS:L, MSc.ENVS, PhD.ENVS <i>Department(s):</i> School of Environmental Sciences

**ENVS\*6506 Forest Ecosystem Patterns and Processes S [0.50]**

Students will learn concepts, techniques and analysis related to the ecological characterization of forests. Focus will be on southern and mid-central Ontario forests and will involve periodic excursions to various locations for the purpose of demonstrating theoretical principles, sampling techniques, in-field measurements, and collecting samples for in-lab assessment.

*Restriction(s):* Preference will be given to students in MES.ENVS:L, MSc.ENVS, PhD.ENVS

*Department(s):* School of Environmental Sciences

**ENVS\*6520 Pollinator Biology F [0.50]**

The biology of pollinators will be discussed in lectures and seminars stressing fundamental and applied aspects. The honey bee will be used as the model system.

*Offering(s):* Offered in odd-numbered years.

*Department(s):* School of Environmental Sciences

**ENVS\*6530 Pollinator Conservation W [0.50]**

In this course students will explore the ecology of pollination with an emphasis on the factors affecting declines in pollinating insects as well as potential mitigation strategies to ensure long-term stability of food production and maintenance of biodiverse wild plant communities. Offered in conjunction with ENVS\*4070. Extra work is required of graduate students.

*Restriction(s):* Credit may be obtained for only one of ENVS\*6530 or ENVS\*4070.

*Department(s):* School of Environmental Sciences

**ENVS\*6540 Integrated Pest Management - Insects W [0.50]**

Concepts associated with integrated pest management of insect pests of various plant hosts will be introduced to students in an interactive lecture and laboratory format. Experiential learning and skill development, associated with economic entomology, will also be emphasized.

*Offering(s):* Offered annually

*Restriction(s):* Credit may be obtained for only one of ENVS\*6540 and ENVS\*4100

*Department(s):* School of Environmental Sciences

**ENVS\*6550 Bioactivity and Metabolism of Insecticides W [0.50]**

The basis of insecticide bioactivity will be examined, with emphasis on mode of action, structure-activity relationships and analytical methods. Students will choose a specific insecticide or class of insecticides as their primary topic of study for the semester. Students will participate in seminars, prepare a conference poster and complete a research paper.

*Offering(s):* Offered in even-numbered years.

*Department(s):* School of Environmental Sciences

**ENVS\*6560 Forest Ecosystem Dynamics F [0.50]**

An exploration of energy flow and distribution in forest ecosystems. Both components will be examined in the context of biomass and productivity, perturbations and resilience. Some aspects of modelling will be covered.

*Offering(s):* Offered in odd-numbered years.

*Department(s):* School of Environmental Sciences

**ENVS\*6582 Special Topics in Soil Science F,W,S [0.50]**

Students will explore topics within soil science such as soil physics, pedology, soil chemistry and microbiology. Normally, an independent course of study will be developed with a faculty advisor and one or more students in the semester prior to enrollment. Occasionally, the course will be offered as a lecture/seminar in a particular area, to be advertised in the semester prior to offering. Typically, students will produce a major paper or scientific report.

*Restriction(s):* Instructor consent required.

*Department(s):* School of Environmental Sciences

**ENVS\*6700 Glacial Sedimentary Environments U [0.50]**

Students will learn about the processes and deposits of glacial environments as well as the use of sedimentary records to reconstruct past glacial environments. Case studies from modern to ancient glacial sedimentary environments will be used. Field trip included.

*Offering(s):* Offered only as needed

*Department(s):* School of Environmental Sciences

**ENVS\*6710 Advanced Sedimentology U [0.50]**

Topics covered through case studies of sedimentary deposits and environments include facies analysis, large scale controls, and novel techniques in sedimentology. Topics may also include specific sedimentary environments or specific sedimentary deposits such as turbidites, cross-bedded strata or seismites depending on student interest. (Offered only as needed)

*Offering(s):* Offered only as needed

*Department(s):* School of Environmental Sciences

**ENVS\*6720 Geology of Groundwater Systems W [0.50]**

This course will examine the geological characteristics and processes that influence groundwater flow systems and contaminant transport and fate in different geological settings. The course will include seminar discussions of readings, guest speakers from industry and government agencies as well as hands-on exercises in class.

*Offering(s):* Offered in alternate years

*Department(s):* School of Environmental Sciences

**ENVS\*6730 Special Topics in Environmental Earth Science F,W,S [0.50]**

Students will explore topics within environmental earth science such as glacial geology, environmental geophysics and hydrogeology. Normally, an independent course of study will be developed with a faculty advisor and one or more students in the semester prior to enrollment. Occasionally, the course will be offered as a lecture/seminar in a particular area, to be advertised in the semester prior to offering. Typically, students will produce a major paper or scientific report.

*Restriction(s):* Instructor consent required.

*Department(s):* School of Environmental Sciences

**ENVS\*6740 Environmental Organic Chemistry W [0.50]**

This course explores the chemical processes that influence organic compounds in the environment. Topics discussed include: the transformation of anthropogenic organic contaminants, the form and function of natural organic matter, and analytical methods including compound specific stable isotope analysis and environmental nuclear magnetic resonance. Offered in conjunction with ENVS\*4370. Extra work is required of graduate students.

*Restriction(s):* Credit may be obtained for only one of ENVS\*6740 or ENVS\*4370.

Preference will be given to students in the MES.ENVS, MSc.ENVS and PhD.ENVS programs.

*Department(s):* School of Environmental Sciences

**ENVS\*6882 Special Topics in Plant and Environmental Health F,W,S [0.50]**

Students will explore topics within plant and environmental health such as integrated pest management, apiculture and environmental microbiology. Normally, an independent course of study will be developed with a faculty advisor and one or more students in the semester prior to enrollment. Occasionally, the course will be offered as a lecture/seminar in a particular area, to be advertised in the semester prior to offering. Typically, students will produce a major paper or scientific report.

*Restriction(s):* Instructor consent required.

*Department(s):* School of Environmental Sciences

**ENVS\*6900 Research Seminar in Environmental Sciences F-W [0.50]**

This course provides information and training in scientific presentations for thesis-based Environmental Sciences (ENVS) programs. Students will prepare a written research proposal and make an oral presentation of their proposed studies. Students are expected to complete this course in their second or third semester of study.

*Restriction(s):* Offered only to MSc.ENVS and PhD.ENVS students

*Department(s):* School of Environmental Sciences

## European Studies

The European Studies MA program is designed to provide students with a flexible, inter- and transdisciplinary approach to European Studies that combines humanities and social science perspectives on the study of European cultures and the concept of European identities. The program has three key objectives: 1) to promote studies crossing boundary-lines of all types and explore European culture in its relations with other continents; 2) to introduce students to a variety of methodological approaches in preparation for advanced doctoral research in the field of the Humanities; 3) to prepare students for careers in the arts, teaching and communication, and management, and to equip them with the skills needed to play leading roles in international institutions, national administrations, cultural organizations or media groups.

### Administrative Staff

#### European Studies Coordinator

Paola Mayer (255 MacKinnon, Ext. 58562)  
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#### Graduate Program Coordinator

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#### Graduate Program Assistant

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### Graduate Faculty

#### Frédérique Arroyas

BA, MA, PhD Western Ontario - Associate Professor, School of Languages and Literatures, French Studies

#### Amanda Boetzkes

BA Victoria, MA, PhD McGill - Associate Professor, School of Fine Art and Music, Art History

#### Donald Bruce

BA Alberta, MA Queen's, PhD Toronto - Professor, School of Languages and Literatures, French Studies and Dean of the College of Arts

#### William Cormack

BA Calgary, MA Carleton, PhD Quebec - Associate Professor, History

#### Dawn Cornelio

BA, MA, PhD Connecticut - Professor, School of Languages and Literatures, French Studies

#### Mary Michelle DeCoste

BA, MA Massachusetts, PhD Cornell - Associate Professor, School of Languages and Literatures, Italian Studies

#### Susannah Ferreira

BA Trent, B.Ed Queen's, MA, PhD, Johns Hopkins - Associate Professor, History

#### Kimberly Francis

MMus, MA Ottawa, PhD Univ. of North Carolina at Chapel Hill - Associate Professor

#### Peter Goddard

BA British Columbia, DPhil Oxford - Associate Professor, History

#### Sally Hickson

BA Carleton, MA, PhD Queen's - Associate Professor, School of Fine Art and Music, Art History and Visual Culture

#### Margot Irvine

BA, MA, PhD Toronto - Associate Professor, School of Languages and Literatures, French Studies

#### Edward Koning

BA, MA Leiden, PhD Queen's - Assistant Professor

#### Sophie Lachapelle

BSc, MA Montreal, PhD Notre Dame - Associate Professor, History

#### David MacDonald

BA Carleton, MA Ottawa, PhD London School of Business - Professor, Political Science

#### Dominic Marner

BA Regina, MA Victoria, PhD East Anglia (United Kingdom) - Associate Professor, School of Fine Art and Music, Art History

#### Paola Mayer

BA Toronto, MA, PhD Princeton - Associate Professor, School of Languages and Literatures, German Studies

#### Alan McDougall

BA, MA, PhD Oxford - Professor, History

#### Jeff Mitscherling

BA California, MA McMaster, PhD Guelph - Professor, Philosophy

#### Ruediger Mueller

BA British Columbia, MA McGill, PhD Queen's - Associate Professor, School of Languages and Literatures, German Studies

#### Padraig O'Cleirigh

BA, MA Ireland, PhD Cornell - Associate Professor, School of Languages and Literatures, Classics

#### Dorothy Odartey-Wellington

BA Ghana, MA, PhD McGill - Associate Professor, School of Languages and Literatures, Spanish Studies

#### Sandra Parmegiani

Laurea, Dottorato Trieste, PhD Toronto - Associate Professor

#### Omid A. Payrow Shabani

BA, MA Carleton, PhD Ottawa - Professor, Philosophy

#### John Russon

BA Regina, MA, PhD Toronto - Professor, Philosophy

#### Andrew Sherwood

BA Calgary, MA Victoria, MA, PhD Princeton - Associate Professor, School of Languages and Literatures, Classics

#### Christina Smylitopoulos

BA Victoria, MA York (UK), PhD McGill - Assistant Professor, School of Fine Art and Music, Art History

#### Clive Thomson

BA, MA, PhD Toronto - Professor, School of Languages and Literatures, French

### Associated Graduate Faculty

#### John Walsh

PhD Otago - Lecturer, School of Languages and Literatures

### MA Program

The European Studies program offers two streams:

1. Exploring European Identities: 3 to 4 consecutive semesters in length, program requirements to be completed mainly at Guelph, with the option of a semester abroad (in France, Germany, Italy or Spain).
2. Crossways in Cultural Narratives, is offered through the University of Guelph's participation in the Erasmus Mundus Consortium. This stream is 2 years in length (2 Fall and 2 Winter semesters) and involves a compulsory mobility component, whereby the student attends 3 different universities in 3 different member-states of the Consortium.

### Admission Requirements

Admission requirements and procedure as well as program requirements for the two streams differ, and are listed separately below.

#### Exploring European Identities

Candidates for admission must hold a BA in an honours program or equivalent from a recognized university or college. The applicant must have achieved a grade average of at least B+ in the work of his/her last four semesters or last two undergraduate years (full-time equivalent). A reading competence in a European language in addition to English is recommended.

#### Crossways in Cultural Narratives

Candidates for admission must have a Bachelor's Degree in an honours program or equivalent in the field of Arts, Languages or Social Sciences; particularly a Modern Languages Degree (e.g. language, literature, thought and cultural studies programs of a high, specialised level relating to one or more of the following: Britain, France, Italy, Portugal, Spain – or Europe as a whole). The applicants must have achieved a grade average of B+ or better (or equivalent), or be among the top 5-10 students of their year. Applicants must also possess a near-native, degree-level command of TWO of the following European Languages: English, French, Italian, Portuguese, and Spanish – together with a basic knowledge of, or a willingness to acquire, a THIRD European language.

Applications should be made through the [Mundus Masters consortium](#)

### Degree Requirements

#### Exploring European Identities

A minimum of 4.00 credits is required for completion of the M.A., to consist of the following:

1. A minimum of six semester courses, each worth 0.5 credits, including: a) Core courses: Team-taught courses on European Identities (EURO\*6010) and Research Methods (EURO\*6000). b) Electives: 2.0 credits to be chosen from a list of restricted electives in European Studies and other programs such as Art History and Visual Culture, English, French, History, Political Science and Philosophy. Visit the EuropeanStudies website for an updated list. <https://www.uoguelph.ca/arts/solal/programs/european-studies/exploring-european-identities-ma>
2. Students will also write a research project (EURO\*6100), worth 1.0 credit of approximately 12,000 words under the supervision of a faculty member.

#### Study Abroad

It is strongly recommended that students study or conduct research abroad. Typically, this would be taken over one semester.

## Crossways in Cultural Narratives

A total of 6.00 credits (120 ECTS minimum) must be obtained: 4.00 for coursework, 1.75 for a thesis of 20,000 words (0.25 or 0.50 credits for the thesis proposal depending on whether students opt for an internship or not, 1.50 for the thesis). Students may opt for an internship worth 0.25 credits.

In compliance with the compulsory mobility component, students are required to obtain 2.00 credits (40 ECTS) from each of 3 universities chosen from the 8 member institutions:

- University of Perpignan Via Domitia, France
- University of Bergamo, Italy
- University of Guelph, Canada
- New University of Lisbon, Portugal
- Adam Mickiewicz University, Poland
- University of Santiago de Compostela, Spain
- University of Saint Andrews, United Kingdom
- University of Sheffield, United Kingdom

The required mobility pattern is as follows: Semester 1 – University A, Semesters 2 & 3 – University B (known as the home university), Semester 4 – University C.

For further details of the program and for downloadable application, visit the [Crossways website at](#)

## Courses

<b>EURO*6000 Research Methods F [0.50]</b>
This course will: a) introduce students to the field and research methods of European Studies, b) familiarize them with field-relevant research skills and methodologies. <i>Department(s):</i> School of Languages and Literatures
<b>EURO*6010 European Identities W [0.50]</b>
This core course examines historical and contemporary ideas of the 'nation' and of 'Europe' and their relationships to identity, from an interdisciplinary perspective. Using core concepts that span various disciplines, the course investigates the construction and implications of national, minority, European and EU identities. <i>Department(s):</i> School of Languages and Literatures
<b>EURO*6020 Myth, Fairy Tales and European Identities U [0.50]</b>
An exploration of how myths and fairy tales have been refashioned in European literature, music and art to express political, social or psychological concerns. Examples will be chosen from different national cultures and epochs. Content will vary according to the interests of the instructor(s). <i>Department(s):</i> School of Languages and Literatures
<b>EURO*6030 Women and the Arts in Europe: Seeking Expression U [0.50]</b>
This course examines women's participation in the arts in Europe. Content will vary according to the interests of the instructor(s). Possible approaches: an examination of women's relationships to European cultural institutions, or the extent of women's participation in central pan-European artistic movements. <i>Department(s):</i> School of Languages and Literatures
<b>EURO*6040 Europe and the Discourse of Civilization U [0.50]</b>
This course explores the genealogy of the idea of 'civilization' with respect to Europe as it emerges from the writings of medieval, renaissance, early modern and modern art historians, and its role in contemporary political discourse. Literature and music may also be included. <i>Department(s):</i> School of Languages and Literatures
<b>EURO*6060 Contemporary Europe U [0.50]</b>
This course examines the major trends and developments in European culture and society since the end of the Cold War and the post-1989 geo-political, social and cultural events. The course will focus on literature, film, art, political and economic theory and will address Europe's transcontinental relationships, inter-European immigration, the role of religious and cultural minorities, the impact of the financial crisis on the Eurozone. Offered in conjunction with EURO*4050. Extra work is required for graduate students. <i>Restriction(s):</i> Credit may be obtained for only one or EURO*6060 or EURO*4050. <i>Department(s):</i> School of Languages and Literatures
<b>EURO*6070 Topics in Comparative European Culture I U [0.50]</b>
An examination of a topic, period, or region in any aspect of European culture. The content of the course will vary according to the topic and the professor teaching the course at any given time. It will also differ from the content of Topics in Comparative European Culture II. <i>Department(s):</i> School of Languages and Literatures

## **EURO\*6072 Topics in Comparative European Culture II U [0.50]**

An examination of a topic, period, or region in any aspect of European culture. The content of the course will vary according to the topic and the professor teaching the course at any given time. It will also differ from the content of Topics in Comparative European Culture I.

*Department(s):* School of Languages and Literatures

## **EURO\*6080 Directed Reading Course F,W,S [0.50]**

An independent reading project carried out by the student under the supervision of a European Studies graduate faculty member.

*Department(s):* School of Languages and Literatures

## **EURO\*6100 Research Project U [1.00]**

This research project will result in a major paper of about 12,000 words. The student chooses a topic with guidance of a faculty member. Oral examination of this work is required. The topic must be approved by the Graduate Committee.

*Department(s):* School of Languages and Literatures

## Family Relations and Applied Nutrition

The Department of Family Relations and Applied Nutrition offers MSc and PhD level graduate study in three fields: 1) applied human nutrition; 2) family relations and human development; and 3) couple and family therapy.

- **Applied Human Nutrition (MSc, PhD)** This field incorporates both physiological and behavioural aspects of human nutrition and spans all age groups in its focus on the role of nutrition in human health and well-being. Faculty have specific interests in clinical and community nutrition, physical activity, nutrition assessment, education, health services research, inter-professional practice and epidemiology. This field of study provides a strong foundation in research and nutrition methodology through required courses and thesis work.
- **Family Relations and Human Development (MSc, PhD)** This field of study emphasizes a balance between theory, empirical research and practice in graduate training. Students have many options for building an individualized program of study combining coursework and thesis research. Building on core theory and methodology courses, students choose from professional and applied courses as well as courses on specialized topics. The area of study has particular strengths in the following areas: child and adolescent development, parent-child and family relations, human sexuality, culture, adult development and gerontology, well-being, evidence-based practice, and social policy.
- **Couple and Family Therapy (MSc)** This field focuses on theory, research, and practice, and is accredited by the Commission on Accreditation for Marriage and Family Therapy Education of the American Association for Marriage and Family Therapy. The curriculum is designed to produce sophisticated therapists and scholars by integrating contemporary theory, research competence, and systemic approaches to therapy in the understanding and treatment of couples, families, and individuals. This integrated course of study is coupled with high standards of professional and ethical conduct, attention to broader social issues that impact couples and families, and an emphasis on issues of diversity, power, and privilege.

An accredited Master of Applied Nutrition (MAN) professional degree program is also offered. Current and prospective graduate students are also directed to the [department website](#). The inter-disciplinary faculty in the department have expertise in psychology, sociology, sexuality, adult development, education, social work, culture, family therapy, nutrition and physical activity. The overarching theme of the work in the department is enhancing lives through science and practice. The faculty share a common interest in expanding and applying knowledge about family relations and human development, especially in relation to the social, emotional, psychological, nutritional, and economic well-being of families across the life cycle. Graduate programs with an emphasis on nutrition and metabolism are available in the Department of Human Health and Nutritional Sciences; those with an emphasis on animal nutrition are available in the Department of Animal Biosciences.

### Canadian Police Information Check

Various ministries within the Government of Ontario require that current criminal reference checks be completed for all students, volunteers and successful candidates for employment who care for, or provide service to, children or vulnerable adults. Students enrolled in practica or field placement courses will be required to submit to the agency with which they are placed, personal information about any criminal convictions and pending criminal charges. The cost of acquiring this criminal reference check from the student's local police department (Canadian Police Information Check) will be the responsibility of each student. Applicants to the MSc in the field of Couple and Family Therapy must submit the original results of this check to the Department of Family Relations and Applied Nutrition prior to beginning in September.

### Administrative Staff

#### Chair

Clare MacMartin (245 MINS, Ext. 52419)  
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### Graduate Faculty

#### Kim Anderson

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#### Lynda M. Ashbourne

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#### John M. Beaton

BA Wilfrid Laurier, MDiv Tyndale Theological Seminary, MSc Guelph, PhD Minnesota - Associate Professor

#### Paula M. Brauer

BHE British Columbia, MS Wisconsin, PhD Toronto - Associate Professor

#### Andrea Breen

BEd McGill, Ed M Harvard, PhD Toronto - Assistant Professor

#### Andrea Buchholz

BAA Ryerson, MSc Guelph, PhD Toronto - Associate Professor

#### Gwenneth Chapman

BSHEC Saskatchewan, MSc, PhD Toronto - Professor and Dean, College of Social and Applied Human Sciences

#### Susan S. Chuang

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#### John Dwyer

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#### Laura Forbes

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#### Leon Kuczynski

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#### Tuuli M. Kukkonen

BA Concordia, PhD McGill - Assistant Professor

#### Clare MacMartin

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#### Tricia van Rhijn

BASc, MSc, PhD Guelph - Assistant Professor

#### Kimberley Wilson

BASc Guelph, MSW Toronto, PhD Guelph - Assistant Professor

### Associated Graduate Faculty

#### Dalia El Khoury

BSc American University of Beirut, MSc American University of Beirut, PhD University of Pierre and Marie Curie (Paris VI) - Contractually Limited Faculty, Family Relations and Applied Nutrition, University of Guelph

#### Donna S. Lero

BA SUNY at Stony Brook, NY, MS, PhD Purdue - Retired Faculty, Family Relations and Applied Nutrition, University of Guelph

### MSc Program

The Department of Family Relations and Applied Nutrition offers an MSc graduate program in three fields: 1) applied human nutrition; 2) family relations and human development; and 3) couple and family therapy.

### Admission Requirements

General admission requirements for these fields of study include an honours degree or equivalent with an average at least 75% in the last two years of study (or 20 credits).

### Applied Human Nutrition

Admission requirements for the MSc program in the field of Applied Human Nutrition are most easily satisfied by applicants with honours degrees in human nutrition, and food and nutrition. Applicants with degrees in related fields (e.g., nutritional sciences, psychology, kinesiology, food science) may be considered with suitable make-up work in core areas. Credit in the following undergraduate courses is normally required by all entering students: 1) a one-semester course in applied statistics within the last five years (minimum grade of 75%); 2) a one-semester course in research methods within the last five years (minimum grade of 75%); 3) a one-semester course in biochemistry; 4) a one-semester course in human physiology (at or beyond the second-year level); 5) two one-semester courses in human development/sociology/psychology/communications; 6) one 300-level and three 400-level one-semester courses in human nutrition. These requirements may be in progress at the time of application. Program offices should be consulted for admission deadlines.

## Family Relations and Human Development

Admission requirements for the MSc program in the field of Family Relations and Human Development can be satisfied by applicants with honours degrees in a wide variety of undergraduate majors including family studies, child studies, psychology, sociology, and nursing. Credit in the following undergraduate courses is required of all entering students: 1) a one-semester course in applied statistics within the last five years (minimum grade of 75%); 2) a one-semester course in social-science research methods within the last five years (minimum grade of 75%); 3) a one-semester course in one of human development, child development, gerontology, or parent-child relations; 4) a one-semester course in one of family sociology, social psychology, family relations, family theory, or communications; 5) three 400-level (senior, fourth year) one-semester courses. Program offices should be consulted for admission deadlines.

NOTE: Department policy does not permit transfer applications from graduate students registered in the MSc in Family Relations and Human Development into the MSc in Couple and Family Therapy.

### Couple and Family Therapy

Admission requirements for the MSc program in the field of Couple and Family Therapy can be satisfied by applicants with honours degrees in a wide variety of undergraduate majors including family studies, child studies, psychology, sociology, and nursing. Credit in the following undergraduate courses is required of all entering students: 1) a one-semester course in applied statistics within the last five years (minimum grade of 70%); 2) a one-semester course in social-science research methods within the last five years (minimum grade of 70%); 3) a one-semester course in one of human development, child development, gerontology, or parent-child relations; 4) a one-semester course in one of family sociology, social psychology, family relations, family theory, or communications; 5) three 400-level (senior, fourth year) one-semester courses. Program offices should be consulted for admission deadlines.

NOTE: Department policy does not permit transfer applications from graduate students registered in the MSc in Family Relations and Human Development into the MSc in Couple and Family Therapy

Relevant work and/or volunteer experience is an asset. The application must include an Overview of Professional Experience and Plans discussing the applicant's motivation for Couple and Family Therapy graduate education (maximum 3 typed pages). There is no need for non-thesis applicants to the MSc in CFT to choose an advisor prior to making the application. Selected applicants are invited for an interview, and will have the opportunity to speak with potential advisors at that time. Applicants for the thesis stream only must also submit the Statement of Academic/Research Intent - a detailed, referenced, research plan outlining the relevance of the topic, the connection to faculty research interests and the specific research questions. Also for thesis applicants only, research advisors can be CFT faculty or faculty from the broader department. While CFT faculty do not have research discussions with thesis applicants prior to the application and selection process, thesis applicants can make prior contact with a potential research advisor in the Department if this is deemed an appropriate fit to applicant's research interests.

The American Association of Marriage and Family Therapy (AAMFT) encourages applications from qualified students who are members of identified minorities. Scholarship aid is available to minority students on a competitive basis from AAMFT.

The most qualified applicants will be short-listed and invited to attend a day-long interviewing process with the Couple and Family Therapy faculty. Participation in the interview is required for admission. Applications from outside of Canada are welcome and external interviewing is appropriately explored. Program offices should be consulted for admission deadlines. Prior to beginning graduate studies in CFT, admitted students must submit a current police record check (CPIC - Canadian Police Information Check) from their local police department.

## Degree Requirements

### Applied Human Nutrition

For all students in the MSc program in the field of Applied Human Nutrition, a minimum of 2.25 graduate credits will be chosen in consultation with the student's advisory committee including:

FRAN*6000	[0.50]	Research Methods
FRAN*6010	[0.50]	Applied Statistics
FRAN*6020	[0.50]	Qualitative Methods
FRAN*6550	[0.25]	Research Seminar

One additional [0.5] graduate elective course such as FRAN\*6610, FRAN\*6510, or other graduate level elective course related to the student's research specialization. It can be taken within Family Relations and Applied Nutrition or in other academic units of the university.

Students who enter the MSc-AHN program from a non-nutrition undergraduate program will also be required to take those undergraduate and/or graduate courses necessary to meet foundational knowledge in applied human nutrition. In addition, students must complete a research thesis.

### Family Relations and Human Development

For all students in the MSc program in the field of Family Relations and Human Development, a total of 3.75 credits will be chosen in consultation with the student's advisor and advisory committee.

Core courses include:

FRAN*6000	[0.50]	Research Methods
FRAN*6010	[0.50]	Applied Statistics
FRAN*6020	[0.50]	Qualitative Methods
FRAN*6340	[0.50]	Interdisciplinary Perspectives in Family Relations and Human Development
FRAN*6330	[0.25]	Research Seminar

In addition, students must complete a research thesis and are required to take a minimum of three (3) additional elective graduate courses (1.5 credits) related to their program of study.

### Couple and Family Therapy

The intensive curriculum in Couple and Family Therapy has been designed to enable students to achieve an integration of theory, practice, and research. Clinical training in the MSc in CFT is guided by a systemic perspective, with emphasis on narrative, solution oriented, emotionally-focused and dialogic approaches. Attention to issues of gender, race, class, ethnicity, sexual identity, and culture as well as experiences of oppression and abuse are infused through all aspects of the curriculum.

Students are expected to develop competence in research. Students may choose to write a thesis, by conducting a research study, or they may choose the major research paper (non-thesis) option, and write a critical paper on a selected clinical topic. The thesis option is recommended for those students intending to pursue PhD studies at the University of Guelph or elsewhere. Thesis students will take additional courses to support their thesis research project (see the courses in the list below). Students completing the degree by the non-thesis option, take FRAN\*6350, Major Paper.

Clinical training consists of four continuous practica (FRAN\*6090) within the on-site Couple and Family Therapy Centre, plus an externship in a community agency (FRAN\*6095). Each onsite practicum requires roughly 300 hours of student engagement (direct and indirect client service, supervision, and class time) over the semester. The externship is 350-400 hours over the semester and requires students to travel up to 100 km to an agency where they will complete the remaining hours required for completion of the program. Prior to graduation the CFT student must accumulate 500 hours of direct therapy work with clients, with at least 250 hours (of the 500 hours) working with couples and/or families. Each practicum student receives a minimum of one hour of individual supervision for every five hours of client in-session contact. In addition, each student participates in a weekly supervision group with a student to supervisor ratio of no more than 8:1. Supervision modalities include live supervision, live observation, video/audio-observation, and case consultation. All program faculty are Clinical Members and Approved Supervisors or Supervisor Candidates of the American Association for Marriage and Family Therapy (AAMFT).

For all students in the MSc in the field of Couple and Family Therapy, a minimum of 9.25 graduate credits are required, including the following:

FRAN*6070	[0.50]	Sexual Issues and Clinical Interventions Across the Life Span
FRAN*6080	[0.50]	Power Relations and Diversity in CFT
FRAN*6090	[0.50]	Practicum in Couple and Family Therapy* *
FRAN*6095	[0.50]	Externship in Couple and Family Therapy
FRAN*6100	[0.50]	Clinical Issues in Couple and Family Therapy* *
FRAN*6120	[0.50]	Theories and Methods of Family Therapy I
FRAN*6130	[0.50]	Theories and Methods of Family Therapy II
FRAN*6140	[0.50]	Professional Issues
FRAN*6160	[0.50]	Introduction to Systemic Practice in Couple and Family Therapy
FRAN*6180	[0.50]	Research Issues in Couple and Family Therapy

### Note

\* Students take FRAN\*6090 and FRAN\*6100 four times throughout their course of study. As such, each course totals 2.0 credits.

In addition to the above required courses, students take one restricted elective (0.50 credits) in the area of human or lifespan development. Course options for this restricted elective may include:

FRAN*6200	[0.50]	Special Topics in Family Relations and Human Development *
FRAN*6310	[0.50]	Family Relationships Across the Life Span
FRAN*6320	[0.50]	Human Sexuality Across the Life Span
FRAN*6340	[0.50]	Interdisciplinary Perspectives in Family Relations and Human Development
FRAN*6370	[0.50]	Social Development During Childhood and Adolescence
FRAN*6410	[0.50]	Developmental Assessment and Intervention in Childhood and Adolescence

### Note

\* The special topic of FRAN\*6200 must meet the COAMFTE criteria for individual development and family relations.

**In addition, for Quantitative thesis students:** Three additional courses are required:

FRAN*6330	[0.25]	Research Seminar
FRAN*6000	[0.50]	Research Methods
FRAN*6010	[0.50]	Applied Statistics

**For Qualitative thesis students:** Two additional courses are required:

FRAN*6330	[0.25]	Research Seminar
FRAN*6020	[0.50]	Qualitative Methods

**For non-thesis students:** One additional course is required:

FRAN*6350	[1.00]	Major Research Paper
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Upon completion of the requirements for the emphasis in Couple and Family Therapy, the student will receive an MSc. The transcript will specify Family Relations and Human Development: Couple and Family Therapy.

## MAN Program

The Master of Applied Nutrition program comprises one year (3 semesters) of graduate course work and competency-based practica. The program is designed to meet the professional practice requirements for becoming a registered dietitian and to foster practice based research skills development.

Students take graduate courses in the three broad areas of competency required for practice: foodservice management, clinical/assessment and community nutrition. These courses focus on the latest research in these fields and provide strong theoretical underpinnings for professional practice. Students increase their knowledge of the field while enhancing their skills in three areas: the research process, critical appraisal and communication. Assignments in the courses apply theories to practice in real-life situations.

Graduates will complete the entry-level competencies of Dietitians of Canada (DC). Completion of the competencies will qualify a graduate to write the Canadian Dietetic Registration Examination (CDRE) to become a member of the College of Dietitians of Ontario (CDO), or another provincial dietetic regulatory body. The program is accredited by Dietitians of Canada as a dietetic internship. The course work and practicum options permit the pursuit of interests in the various areas of dietetic practice, while meeting the required entry-level dietetic competencies. Students are charged a practicum fee for each semester of the program, in addition to the University academic and non-academic fees.

## Admission Requirements

Students applying to the Master of Applied Nutrition program must have an honours degree within the previous three years from a dietetic program accredited by Dietitians of Canada. Applicants should have a minimum average of at least 75% in the last two years of their undergraduate program. Credit in the following courses is required prior to beginning the program: 1) a one-semester course in applied statistics within the last five years (minimum grade of 75%); and 2) a one-semester course in research methods within the last five years (minimum grade of 75%). These requirements may be in progress at the time of application.

All applications will be reviewed by a committee of Applied Human Nutrition (AHN) graduate faculty. The AHN faculty will interview the most qualified applicants, rank the candidates and forward recommendations to the Assistant Vice-President (Graduate Studies). Program offices should be consulted for admission deadlines.

## Degree Requirements

For all students in the MAN program, a minimum of 6.5 graduate credits are required, including the following required courses:

FRAN*6510	[0.50]	Nutrition in the Community
FRAN*6610	[0.50]	Advances in Clinical Nutrition/Assessment I
FRAN*6710	[1.50]	Practicum in Applied Human Nutrition I
FRAN*6720	[1.50]	Practicum in Applied Human Nutrition II
FRAN*6730	[1.50]	Practicum in Applied Human Nutrition III
FRAN*6740	[0.50]	Foodservice Management in Healthcare
FRAN*6750	[0.50]	Final Project in Applied Human Nutrition

Graduates who have completed all required competencies successfully can apply to write the Canadian Dietetic Registration Examination (CDRE) and apply for membership in the College of Dietitians of Ontario (CDO).

## PhD Program

The Department of Family Relations and Applied Nutrition offers a PhD graduate program in two fields: 1) applied human nutrition; and 2) family relations and human development.

The PhD program in the field of Applied Human Nutrition is a course of study with a strong research focus involving biological, epidemiological and/or social-science perspectives, typically completed within four years (12 semesters). Each student works closely with an advisory committee in developing an individualized program of study that provides depth and addresses the student's specific research and professional goals.

The PhD program in the field of Family Relations and Human Development is a course of study with a strong research focus, typically completed within four years (12 semesters). Each student works closely with an advisory committee to develop an individualized course of study that provides depth and addresses the student's specific research and professional goals. Building on core theory and methodology courses, students choose from professional and applied courses as well as courses on specialized topics. The PhD in FRHD has particular strengths in the following areas: child and adolescent development, parent-child and family relations, human sexuality, culture and acculturation, adult development and gerontology, evidence-based practice, well-being, and social policy.

## Admission Requirements

### Applied Human Nutrition

Students applying to the PhD program in the field of Applied Human Nutrition should have an MSc degree (or in progress) in human nutrition or a related field. Credit in the following courses is required prior to beginning the program: 1) a one-semester course in applied statistics within the last five years (minimum grade of 75%); 2) a one-semester course in research methods within the last five years (minimum grade of 75%); PhD-AHN students must also have taken prior to beginning the PhD program OR will take during the PhD program, undergraduate and/or graduate courses needed to meet foundational knowledge in applied human nutrition. These courses may include, but are not limited to: introductory human nutrition, human physiology, psychology, communications/counselling, and human development/ sociology/psychology/ communications. A master's thesis is normally required for admission. These requirements may be in progress at the time of application.

### Family Relations and Human Development

Students applying to the PhD program in the field of Family Relations and Human Development should have an MSc degree (or in progress) in Family Relations and Human Development or a closely related degree program (e.g., human development, gerontology, psychology, sociology, couple and family therapy, social work). Credit in the following courses is required prior to beginning the program: 1) a one-semester course in applied statistics within the last five years (minimum grade of 75%); and, 2) a one-semester course in research methods within the last five years (minimum grade of 75%). A master's thesis is normally required for admission.

Students enrolled in the MSc program in the fields of Applied Human Nutrition or Family Relations and Human Development are not automatically considered for the respective PhD program; a formal application is required for those wishing admission. All applications are evaluated with reference to academic, research, and professional experience with particular emphasis on research background and potential.

## Degree Requirements

### Applied Human Nutrition

PhD students in Applied Human Nutrition are required to take a minimum of 1.75 graduate credits including FRAN\*6550 and three additional graduate courses [0.5 credits each] chosen in consultation with the student's advisory committee such as but not limited to:

FRAN*6440	[0.50]	Applied Factor Analysis & Structural Equation Modelling
FRAN*6610	[0.50]	Advances in Clinical Nutrition/Assessment I
FRAN*6510	[0.50]	Nutrition in the Community

and/or other graduate elective courses, and which may be taken within Family Relations and Applied Nutrition or in other academic units of the university.

NOTE: Students who do not have a Master's degree awarded by the Dept Family Relations and Applied Nutrition or from another comparable program, will be required to take the relevant methods courses offered by the department as part of their graduate program. Students who enter the PhD-AHN program from a non-nutrition undergraduate or MSc program will also be required to take those undergraduate and/or graduate courses necessary to meet foundational knowledge in applied human nutrition.

In addition, students must complete a research thesis.

### Family Relations and Human Development

PhD students in Family Relations and Human Development are required to take a minimum of 3.25 credits that build a foundation for their research and/or practice:

FRAN*6000	[0.50]	Research Methods
FRAN*6010	[0.50]	Applied Statistics
FRAN*6020	[0.50]	Qualitative Methods
FRAN*6440	[0.50]	Applied Factor Analysis & Structural Equation Modelling
FRAN*6340	[0.50]	Interdisciplinary Perspectives in Family Relations and Human Development
FRAN*6280	[0.50]	Theorizing in Family Relations and Human Development
FRAN*6330	[0.25]	Research Seminar

Most students take additional elective graduate courses related to their program of study. The student's selection of elective courses is primarily determined by research specialization. Each student works closely with an advisory committee in developing an individualized program of study by selecting courses that not only provide for interdisciplinary breadth but also address the student's specific research and professional goals. Each of the emphases also indicates areas of research that reflect current faculty interests and is intended to help students define an area of research and study.

## Courses

### Applied Human Nutrition

#### FRAN\*6510 Nutrition in the Community W [0.50]

Concepts and knowledge of nutrition as applied in community and public health nutrition. Examination of current programs in applied nutrition.

*Restriction(s):* Instructor consent required. Consent required for non-FRAN students.

*Department(s):* Department of Family Relations and Applied Nutrition

#### FRAN\*6550 Research Seminar U [0.25]

Research literature in applied nutrition. Registration for this course occurs in semester 5 for MSc students and semester 7 for PhD students. Students attend weekly seminars in each of the Fall and Winter semesters of their program of study.

*Department(s):* Department of Family Relations and Applied Nutrition

#### FRAN\*6560 Special Topics in Applied Human Nutrition U [0.50]

Contemporary research and special topics in applied human nutrition. Course content is unique to each offering.

*Restriction(s):* Instructor consent required. Consent required for non-FRAN graduate students.

*Department(s):* Department of Family Relations and Applied Nutrition

#### FRAN\*6610 Advances in Clinical Nutrition/Assessment I F [0.50]

An advanced overview of nutritional assessment and clinical nutrition with emphasis on issues relevant to community based and non-acute care settings. Nutrition assessment methods will be discussed in depth along with emerging issues. Emphasis on clinical nutrition will be integration of theory and practice.

*Restriction(s):* Instructor consent required. Consent required for non-FRAN students.

*Department(s):* Department of Family Relations and Applied Nutrition

#### FRAN\*6710 Practicum in Applied Human Nutrition I F [1.50]

This course provides a practicum of 3 days per week with a dietetic-related agency or organization to develop and perform dietetic competencies (internship experience). In weekly seminars, students discuss and reflect on theory and dietetic practice issues.

*Restriction(s):* For MAN students only.

*Department(s):* Department of Family Relations and Applied Nutrition

#### FRAN\*6720 Practicum in Applied Human Nutrition II W [1.50]

This course provides a practicum of 3 days per week with a dietetic-related agency or organization to develop and perform dietetic competencies (internship experience). In weekly seminars, students discuss and reflect on theory and dietetic practice issues

*Prerequisite(s):* FRAN\*6710

*Restriction(s):* For MAN students only.

*Department(s):* Department of Family Relations and Applied Nutrition

#### FRAN\*6730 Practicum in Applied Human Nutrition III S [1.50]

This course provides a practicum of 3 days per week with a dietetic-related agency or organization to develop and perform dietetic competencies (internship experience). In weekly seminars, students discuss and reflect on theory and dietetic practice issues.

*Prerequisite(s):* FRAN\*6720

*Restriction(s):* For MAN students only.

*Department(s):* Department of Family Relations and Applied Nutrition

#### FRAN\*6740 Foodservice Management in Healthcare W [0.50]

Students will critically assess and integrate foodservice management literature and theories to address the multifactorial issues in foodservice operations in healthcare. Case studies presented by expert guests and operational projects will support student synthesis and evaluation of the literature.

*Restriction(s):* Instructor consent required. Consent required for non-FRAN students.

*Department(s):* Department of Family Relations and Applied Nutrition

#### FRAN\*6750 Final Project in Applied Human Nutrition S,F,W [0.50]

This supervised project includes a written report and oral presentation of an applied research project or a proposal for a research project, consisting of a literature view, purpose, methodology, and analysis plan. Students register in and work on the project for 3 consecutive semesters.

*Restriction(s):* For MAN students only.

*Department(s):* Department of Family Relations and Applied Nutrition

### Family Relations and Human Development

#### FRAN\*6000 Research Methods F [0.50]

This course includes critical appraisal of the research literature. Research ethics, subject selection, measurement issues, survey design, experimental and quasi-experimental designs, cross-sectional and longitudinal designs, scale development, questionnaire development and sampling strategies are discussed.

*Department(s):* Department of Family Relations and Applied Nutrition

#### FRAN\*6010 Applied Statistics F [0.50]

Students will learn conceptual and practical applications of statistical analyses with emphasis on hypothesis formation, data screening, test selection, inferential statistics, univariate and multivariate analysis of variance/covariance (including repeated measures designs), simple and multiple regression, logistic regression, regression diagnostics, model building and path analytic techniques.

*Co-requisite(s):* FRAN\*6000

*Restriction(s):* Instructor consent required. Consent required for non-FRAN students.

*Department(s):* Department of Family Relations and Applied Nutrition

#### FRAN\*6020 Qualitative Methods W [0.50]

This course teaches students how to use qualitative methods as a mode of inquiry for understanding issues in human development, nutrition and family relationships. The emphasis is on project design, data collection techniques, analysis strategies and procedures for final write-up.

*Department(s):* Department of Family Relations and Applied Nutrition

#### FRAN\*6070 Sexual Issues and Clinical Interventions Across the Life Span S [0.50]

This course examines sexual issues and clinical interventions from a life span perspective. Focusing upon theory, research and clinical interventions it explores the relationship between issues in sexual development and sexual functioning. This course is offered in a one-week intensive format in coordination with the Guelph Sexuality Conference.

*Restriction(s):* Instructor consent required.

*Department(s):* Department of Family Relations and Applied Nutrition

#### FRAN\*6200 Special Topics in Family Relations and Human Development U [0.50]

Contemporary research in family relations and human development. Research topics vary.

*Restriction(s):* Instructor consent required. Consent required for non-FRAN graduate students.

*Department(s):* Department of Family Relations and Applied Nutrition

#### FRAN\*6210 Program Evaluation U [0.50]

An examination of the theoretical principles and practical applications of evaluation issues and strategies. Special attention is given to services for children and families across the life span. (Offered in alternate years.)

*Restriction(s):* Instructor consent required in Summer semester.

*Department(s):* Department of Family Relations and Applied Nutrition

#### FRAN\*6221 Evidence-Based Practice and Knowledge Translation U [0.50]

The principles of evidence-based practice are examined using various examples of psychosocial, behavioural and health interventions. The levels of evidence, criteria for efficacy and effectiveness, and the importance and limitations of evidence-based practice will be evaluated. The process of moving knowledge derived from high quality evidence into practice will be appraised throughout the course. Students will have the opportunity to build knowledge in their own areas of interest.

*Offering(s):* Offered in alternate years.

*Department(s):* Department of Family Relations and Applied Nutrition

#### FRAN\*6260 Practicum in Family Relations and Human Development U [0.50]

Supervised practicum experience in a variety of agencies or services. Interested students are encouraged to discuss this option with their faculty advisor. Placements are arranged on an individual basis subject to the requirements of students' programs of study and must be negotiated with faculty in advance of registration.

*Restriction(s):* Available to FRAN graduate students only.

*Department(s):* Department of Family Relations and Applied Nutrition

#### FRAN\*6270 Issues in Family-Related Social Policy U [0.50]

This course investigates definitions of social policy, comparative family-related social policy, selected issues in Canadian family policy and frameworks for analysis of social policy. Issues in policy-related research are also explored.

*Offering(s):* Offered in alternate years.

*Department(s):* Department of Family Relations and Applied Nutrition

#### FRAN\*6280 Theorizing in Family Relations and Human Development U [0.50]

An examination of the meaning of science and theory in relation to the study of families and human development. Included is a discussion of the major social science paradigms including positivism, critical theory, social constructionism and post-modernity. This course is designed for doctoral students.

*Offering(s):* Offered in alternate years.

*Department(s):* Department of Family Relations and Applied Nutrition

#### FRAN\*6310 Family Relationships Across the Life Span U [0.50]

Considers theory and research on family and social relationships across the life span. Examples may include: parent-child, sibling, grandparent, couples, etc.

*Offering(s):* Offered in alternate years.

*Department(s):* Department of Family Relations and Applied Nutrition

**FRAN\*6320 Human Sexuality Across the Life Span U [0.50]**

This course covers research, theoretical and substantive issues relevant to studying human sexuality across the life span. Topics include: child and adolescent sexuality, sexual identity, sexuality in adulthood and old age, sexual assault, international research and sex education.

*Offering(s):* Offered in alternate years.

*Department(s):* Department of Family Relations and Applied Nutrition

**FRAN\*6330 Research Seminar U [0.25]**

Research literature in Family Relations and Human Development. Registration for this course occurs in semester 5 for MSc students and semester 7 for PhD students. Thesis students attend weekly seminars in each of the Fall and Winter semesters of their program of study.

*Restriction(s):* Available to FRAN graduate students only.

*Department(s):* Department of Family Relations and Applied Nutrition

**FRAN\*6340 Interdisciplinary Perspectives in Family Relations and Human Development U [0.50]**

This course acquaints students with the diverse disciplinary perspectives used in the study of family relations and human development. Substantive research issues provide a forum for integrating the separate perspectives and understanding the reciprocal relationship between individual and family growth and development.

*Department(s):* Department of Family Relations and Applied Nutrition

**FRAN\*6370 Social Development During Childhood and Adolescence U [0.50]**

A detailed study of factors important to social development and competence from infancy through adolescence.

*Offering(s):* Offered in alternate years.

*Department(s):* Department of Family Relations and Applied Nutrition

**FRAN\*6410 Developmental Assessment and Intervention in Childhood and Adolescence U [0.50]**

An examination of psychological difficulties encountered in childhood and adolescence. Special attention will be given to theoretical models used to explain childhood difficulties, categorization systems, assessment techniques, methods of intervention, as well as ethical issues specific to working with children and adolescence.

*Offering(s):* Offered in alternate years.

*Department(s):* Department of Family Relations and Applied Nutrition

**FRAN\*6440 Applied Factor Analysis & Structural Equation Modelling U [0.50]**

This course introduces students to exploratory factor analysis, confirmatory factor analysis, and structural equation modeling. Topics include: model selection and validation, multiple group models, measurement equivalence/invariance and latent mean analyses. This course is data-driven and students will learn through hands-on analytic experiences accompanied by in-class lectures and readings.

*Offering(s):* Offered in alternate years.

*Prerequisite(s):* FRAN\*6000, FRAN\*6010

*Restriction(s):* Instructor consent required. Consent required for non- FRAN students.

*Department(s):* Department of Family Relations and Applied Nutrition

**Couple and Family Therapy****Note**

The following courses are taken primarily by students in the Couple and Family Therapy emphasis. A limited number of spaces are available in some courses for students outside the Couple and Family Therapy area.

**FRAN\*6080 Power Relations and Diversity in CFT U [0.50]**

This course provides a foundational review of current perspectives within and outside of the couple and family therapy literature that relate to the intersection of culture (race, ethnicity, class, gender, sexuality, ability, etc.) and oppression. Attention is given to the translation of knowledge about power relations and diversity into practice when working as a couple and family therapist with clients and professional colleagues.

*Restriction(s):* Instructor consent required.

*Department(s):* Department of Family Relations and Applied Nutrition

**FRAN\*6090 Practicum in Couple and Family Therapy\* U [0.50]**

This course features supervised clinical practice in couple and family therapy. It involves regular clinical work with couples, families, and individuals. Students meet with faculty each week for up to six hours of supervision. Supervision over the semester will involve both group and individual/dyadic meetings.

*Restriction(s):* Available only to students in the Couple and Family Therapy program

*Department(s):* Department of Family Relations and Applied Nutrition

**FRAN\*6095 Externship in Couple and Family Therapy S [0.50]**

This is an advanced clinical practicum in Couple and Family Therapy. Students are placed in a community agency where they accumulate 10-15 hours per week (over 3 days) of direct clinical contact time. All clinical work is supervised by a clinical supervisor on site. Travel to the community agency is usually required.

*Prerequisite(s):* FRAN\*6090

*Restriction(s):* Available only to students in the Couple and Family Therapy field of study

*Department(s):* Department of Family Relations and Applied Nutrition

**FRAN\*6100 Clinical Issues in Couple and Family Therapy\* U [0.50]**

This course is taken four times in the two year program of study. Each offering features selected clinical issues; examination of each issue will include the socio-cultural context, theoretical location, and conceptual and practical implications for couple and family therapy.

*Restriction(s):* Available only to students in the Couple and Family Therapy field of study.

*Department(s):* Department of Family Relations and Applied Nutrition

**FRAN\*6120 Theories and Methods of Family Therapy I W [0.50]**

This course will offer an historical perspective on the development of the field of couple and family therapy beginning with family systems therapy, through intergenerational models, to current constructionist approaches. Intervention methods consistent with these conceptual frameworks are examined.

*Offering(s):* Offered in alternate years.

*Department(s):* Department of Family Relations and Applied Nutrition

**FRAN\*6130 Theories and Methods of Family Therapy II F [0.50]**

This course explores clinical theory and methods associated with structural, strategic and solution focused models of couple and family therapy. Feminist perspectives and approaches are used to examine power and gender dynamics in therapy.

*Offering(s):* Offered in alternate years.

*Department(s):* Department of Family Relations and Applied Nutrition

**FRAN\*6140 Professional Issues U [0.50]**

An exploration of ethics in couple and family therapy; legal issues in the practice of family therapy; and professional issues regarding identity, licensure and practice.

*Department(s):* Department of Family Relations and Applied Nutrition

**FRAN\*6160 Introduction to Systemic Practice in Couple and Family Therapy F [0.50]**

An exploration of family process to understand diversity in family structures and functioning from a systemic conceptual framework. Applied activities in the associated tutorial section focus on developing basic communication, observational, and therapy skills. Student participation in small learning groups supports skill development and integration of theory and practice.

*Restriction(s):* Available only to students in the Couple and Family Therapy field of study

*Department(s):* Department of Family Relations and Applied Nutrition

**FRAN\*6180 Research Issues in Couple and Family Therapy F [0.50]**

The focus of this course is on research in Couple & Family Therapy, including issues related to evidence-based practice, therapeutic outcome, and therapeutic process. A selected review of quantitative and qualitative research methods and exemplary research is included.

*Offering(s):* Offered in alternate years.

*Restriction(s):* Available to FRAN graduate students only.

*Department(s):* Department of Family Relations and Applied Nutrition

**FRAN\*6350 Major Research Paper U [1.00]**

The major research paper is an option open **only** to MSc students within the Couple and Family Therapy area. Students must demonstrate their ability to accurately synthesize and critically evaluate the literature in a specific area of interest. Detailed guidelines are provided.

*Restriction(s):* Available only to students in the Couple and Family Therapy field of study.

*Department(s):* Department of Family Relations and Applied Nutrition

\* Each of FRAN\*6090 and FRAN\*6100 are taken four consecutive semesters

## Food, Agricultural and Resource Economics

The graduate programs in Food, Agricultural and Resource Economics offers opportunities for master of science (MSc), master in food, agricultural and resource economics (MFARE) and doctor of philosophy (PhD). The thesis-based MSc and PhD are research-oriented degrees which require both course work and a thesis. The course-based MFARE degree requires either course work with a major research paper or course work alone.

The MSc, MFARE and PhD program in Food, Agricultural and Resource Economics focuses on two major fields of emphasis:

- Food and agricultural economics
- Natural resource and environmental economics

### Administrative Staff

#### Chair

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#### Getu Hailu

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#### Spencer Henson

BSc, PhD Reading - Professor

#### Alan Ker

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#### Rakhal C. Sarker

BSc, MSc Bangladesh, PhD Guelph - Associate Professor

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#### Ken McEwan

BSc, MSc Guelph - College Professor, Ridgetown Campus Director

#### Ying (Jessica) Cao

BA Nankai Univ, MA Tsinghua Univ, PhD Cornell - Assistant Professor, State University of NY at Buffalo

### MFARE Program

The Master of Food, Agricultural and Resource Economics focuses on two major fields of emphasis: 1) food and agricultural economics; and 2) natural resource and environmental economics.

The MFARE program provides an alternative pathway to graduate education related to the economics of food, agriculture, and natural resources, with an emphasis on skills acquisition and development of industry specific expertise. Through expanded course work requirements, students develop a breadth of exposure to empirical methods and analytical approaches to undertaking policy analysis and research, and enhanced communication skills.

### Admission Requirements

All students entering the MFARE program must have achieved the University required minimum 70% (B-) average or equivalent. In addition, they are expected to have already taken, the following basic courses:

- Intermediate level micro- and macro-economic theory (ECON\*2310 and ECON\*2410 or equivalent)
- Calculus and matrix algebra with applications to economics (ECON\*2770 or equivalent)
- Intermediate level statistics (ECON\*3740 or equivalent).

The Graduate Program Committee examines each application before the student is proposed to the Office of Graduate & Postdoctoral Studies for admission into the program. Potential students are strongly encouraged to take an undergraduate course in advanced microeconomic theory as preparation for the course work in the MFARE.

### Degree Requirements

By the end of their first semester, students must choose one of the following two options.

#### Course Work and Major Research Paper

In order to satisfy the degree requirements of the course work and major research paper option, students will complete successfully five required courses, a seminar course (FARE\*6800) and a research project course (FARE\*6140) and two graduate courses approved by the student's advisory committee. The five required courses (assuming all undergraduate background requirements have been met) are:

FARE*6100	[0.50]	The Methodologies of Economics
FARE*6380	[0.50]	Applied Microeconomics for Agricultural Economists
FARE*6400	[0.50]	Advanced Topics in Agricultural Economics
FARE*6910	[0.50]	Applied Policy Analysis I
FARE*6970	[0.50]	Applied Quantitative Methods for Agricultural Economists
Two graduate courses as approved by the student's advisory committee		
FARE*6800	[0.00]	Seminar in Agricultural Economics
FARE*6140	[1.00]	Major Paper in Food, Agricultural and Resource Economics

#### Course Work

In order to satisfy the degree requirements of the course work option, students will complete successfully five required courses listed below plus four additional graduate courses approved by the student's advisory committee. Students in this option are restricted from taking FARE\*6140.

FARE*6100	[0.50]	The Methodologies of Economics
FARE*6380	[0.50]	Applied Microeconomics for Agricultural Economists
FARE*6400	[0.50]	Advanced Topics in Agricultural Economics
FARE*6910	[0.50]	Applied Policy Analysis I
FARE*6970	[0.50]	Applied Quantitative Methods for Agricultural Economists
Four additional graduate courses approved by the student's advisory committee		

### MSc Program

The MSc program in Food, Agricultural and Resource Economics focuses on two major fields of emphasis: 1) food and agricultural economics; and 2) natural resource and environmental economics.

The aim of the MSc program is to develop in students a fundamental understanding of economic principles and their application in identifying and solving relevant problems related to food, agriculture, and natural resources. The program also strives to develop appropriate analytical, methodological, and communication skills to enable students to analyze agriculture and resource problems effectively and explain their findings.

### Admission Requirements

All students entering the Master of Science program must have achieved the University required minimum 70% (B-) average or equivalent. In addition, they are expected to have already taken, the following basic courses:

- Intermediate level micro- and macro-economic theory (ECON\*2310 and ECON\*2410 or equivalent)
- Calculus and matrix algebra with applications to economics (ECON\*2770 or equivalent)
- Intermediate level statistics (ECON\*3740 or equivalent).

The Graduate Program Committee examines each application before the student is proposed to the Office of Graduate & Postdoctoral Studies for admission into the program. Potential students are strongly encouraged to take an undergraduate course in advanced microeconomic theory as preparation for the course work in the MSc.

### Degree Requirements

In order to satisfy the degree requirements of the MSc, students will complete successfully six courses, a seminar course, and write and defend an original MSc thesis. The minimum course work requirements (assuming all undergraduate background requirements have been met) are:

FARE*6100	[0.50]	The Methodologies of Economics
FARE*6380	[0.50]	Applied Microeconomics for Agricultural Economists
FARE*6910	[0.50]	Applied Policy Analysis I

FARE\*6970 [0.50] Applied Quantitative Methods for Agricultural Economists  
Two graduate courses as approved by the student's advisory committee

FARE\*6800 [0.00] Seminar in Agricultural Economics

## PhD Program

The PhD program in Food, Agricultural and Resource Economics focuses on two major fields of emphasis: 1) food and agricultural economics; and 2) natural resource and environmental economics.

Across these areas there is a focus on both developed and developing countries. Students in the PhD program focus on an area of specialization relevant to their thesis research, plus complete courses in microeconomic theory and economic research methods. All students must complete and defend a thesis in their chosen area of specialization.

## Admission Requirements

Minimum University of Guelph admission requirements for a Doctoral program include: 1) a satisfactory baccalaureate; and 2) at the very minimum a 'B' average in a recognized Master's degree. Students entering the PhD program are expected to have satisfied the requirements, or their equivalents, of the department's MSc degree in Food, Agricultural and Resource Economics. All applicants are required to upload valid GRE (General exam only) scores with their electronic application prior to the departmental application deadline.

In cases where a student's master's degree is not equivalent to that offered by the department, the student may initially be accepted into the MSc program and may then apply for transfer to the PhD program at some time during the first three semesters. Applications for transfer must be supported by the Graduate Program Committee and approved by the Board of Graduate Studies. The student does not have to complete all the requirements of the MSc before transferring to the PhD program, but must achieve high academic standing.

## Degree Requirements

Students enrolled in the PhD program must successfully complete a program of at least ten taught courses that prepare them for the various elements of the qualification examination and thesis research, as outlined below. However, students that are able to demonstrate a satisfactory level of competence in any of these requirements may have these course requirements adjusted accordingly, subsequent to evaluation and the decision of the Graduate Program Committee.

### Microeconomic Theory:

ECON\*6000 [0.50] Microeconomic Theory I

ECON\*6010 [0.50] Microeconomic Theory II

### Economic Research Methods:

ECON\*6140 [0.50] Econometrics I

ECON\*6160 [0.50] Econometrics II

FARE\*6100 [0.50] The Methodologies of Economics

FARE\*6970 [0.50] Applied Quantitative Methods for Agricultural Economists

### Food, Agricultural and Resource Economics

FARE\*6920 [0.50] Applied Policy Analysis II

FARE\*6400 [0.50] Advanced Topics in Agricultural Economics

Plus ONE from the following:

FARE\*6940 [0.50] Food Firms, Consumers and Markets II

FARE\*6960 [0.50] Natural Resource Economics II

Plus ONE other graduate course approved by the student's advisory committee.

Students may also be permitted to take other courses as substitutes for the above, subject to approval by the Departmental Graduate Program Committee.

## Qualifying Examination

It should be noted that successful completion of the above courses is not necessarily sufficient for qualification to PhD candidacy.

Students are expected to complete successfully the qualifying examination in microeconomic theory that aims to assess a student's understanding of key theoretical concepts. Students are allowed two attempts at this qualifying examination. Students are expected to write the first attempt at this exam in the Summer semester of their first year and (i.e. their third semester in the program), if necessary, the second attempt in the Fall semester of their second year (i.e. their fourth semester in the program). Students that fail the examination at the second attempt will not be permitted to continue.

## Collaborative Specializations

### International Development Studies

The Department of Food, Agricultural and Resource Economics participates in the International Development Studies (IDS) collaborative specialization. Please consult the International Development Studies listing for a detailed description of the MFARE/MSc/PhD collaborative specialization including the special additional requirements for each of the participating departments.

## Courses

### Production Economics

#### FARE\*6380 Applied Microeconomics for Agricultural Economists F [0.50]

The objective of this course is to foster a deeper understanding of standard microeconomic concepts and their application to a wide variety of topics in food, agricultural, and resource economics. Emphasis is placed on what tool(s) to use in a wide variety of circumstances to address real life problems. Topics will include decisions by firms and consumers, market equilibrium, and production decisions.

*Prerequisite(s):* ECON\*2770 or equivalent, ECON\*2310 or equivalent, ECON\*3740 or equivalent

*Department(s):* Department of Food, Agricultural and Resource Economics

#### FARE\*6970 Applied Quantitative Methods for Agricultural Economists F [0.50]

This course exposes students to the empirical tools agricultural economists use when conducting research. Emphasis is placed on what tool(s) to use in a variety of circumstances. Topics covered will include advanced econometric techniques, optimization and simulation modelling. Students will also be exposed to the different quantitative software packages used in empirical research.

*Prerequisite(s):* ECON\*3740 or equivalent and ECON\*2770 or equivalent

*Department(s):* Department of Food, Agricultural and Resource Economics

### Agricultural Policy and Trade

#### FARE\*6600 Food Security and the Economics of Agri-Food Systems in Developing Countries F [0.50]

The aim of this course is to understand the nature of food security in developing countries and relations with the economic performance of the agri-food system. Towards this aim, the course focuses on both the agri-food system's role in the supply of nutritious food and its importance as a source of livelihood and as a driver of overall processes of economic development.

*Prerequisite(s):* ECON\*1050 or equivalent, ECON\*1100 or equivalent

*Department(s):* Department of Food, Agricultural and Resource Economics

#### FARE\*6910 Applied Policy Analysis I W [0.50]

An overview of domestic and international agri-food policies and an introduction to the concepts and methods used to evaluate domestic trade policies.

*Prerequisite(s):* FARE\*6380

*Department(s):* Department of Food, Agricultural and Resource Economics

#### FARE\*6920 Applied Policy Analysis II U [0.50]

A presentation and evaluation of advanced quantitative agri-food policy models and selected special topics related to domestic and trade policy evaluation.

*Prerequisite(s):* AGECE\*6910 or FARE\*6910 or equivalent

*Co-requisite(s):* ECON\*3710

*Department(s):* Department of Food, Agricultural and Resource Economics

#### FARE\*6980 Agricultural Trade Relations W [0.50]

An examination of the institutional, theoretical and empirical aspects of international agri-food trade.

*Prerequisite(s):* FARE\*6380

*Department(s):* Department of Food, Agricultural and Resource Economics

### Economics of Food Markets

#### FARE\*6930 Food Firms, Consumers and Market I F [0.50]

This course examines the application of microeconomic theory to food markets. Topics covered include: optimizing behaviour by economic agents, the certainty equivalent profit model and decision making under risk, optimal capital replacement models and their application to food system economics, consumer behaviour with respect to food products and behaviour with respect to food products and behaviour of marketing intermediaries and food processors. New developments in the economic theory of the form are surveyed.

*Prerequisite(s):* ECON\*2310 or equivalent, ECON\*3740 or equivalent

*Department(s):* Department of Food, Agricultural and Resource Economics

#### FARE\*6940 Food Firms, Consumers and Markets II U [0.50]

This course builds on Food Firms, Consumers and Markets I by extending the breadth and depth of student's understanding and scope of economic analysis. Advanced techniques in producer and consumer theory, as well as advance market analysis techniques are presented and utilized. Understanding of the research process and advanced methods is emphasized throughout.

*Prerequisite(s):* AGECE\*6930 or FARE\*6930

*Department(s):* Department of Food, Agricultural and Resource Economics

## Natural Resource Economics

### **FARE\*6950 Natural Resource Economics I W [0.50]**

Natural Resources I introduces conventional theoretical modeling approaches to renewable resources, e.g. fisheries & forestry. Seminal theoretical literature is discussed. Emphasis is placed on setting up economic models, deriving and interpreting general results. Applied methods include dynamic optimization and regression analysis. Additional topics include Land Economics and the property rights approach.

*Prerequisite(s):* FARE\*6380

*Department(s):* Department of Food, Agricultural and Resource Economics

### **FARE\*6960 Natural Resource Economics II U [0.50]**

Natural Resources II reviews & extends conventional theoretical modeling approaches to renewable resources, e.g. fisheries & forestry. Seminal literature is reviewed and contemp. theoretical work and empirical papers discussed. Emphasis on extending economic models addressing natural resource issues - uncertainty, externalities & policy instruments, and derive reduced-form versions of forestry & fishery for empirical estim. & analysis. Primary method of math analysis involves dyn. opt. techniques. Detailed math derivations & proofs expected. Also- extinction, climate change, carb sequest.

*Prerequisite(s):* AGECE\*6950 or FARE\*6950

*Department(s):* Department of Food, Agricultural and Resource Economics

## Other Courses

### **FARE\*6100 The Methodologies of Economics W [0.50]**

Alternative views on the methodology of economics are reviewed and assessed. The process of problem identification in the development of a research project proposal is investigated.

*Department(s):* Department of Food, Agricultural and Resource Economics

### **FARE\*6140 Major Paper in Food, Agricultural and Resource Economics U [1.00]**

The major paper is an option only available to MFARE students registered in the course work master program. An original research project related to the specialization of choice in food, agricultural and resource economics will be undertaken. The project will include preparation of a written paper and an oral presentation of the findings to the faculty.

*Restriction(s):* Restricted to students in the course-based MFARE program in FARE

*Department(s):* Department of Food, Agricultural and Resource Economics

### **FARE\*6400 Advanced Topics in Agricultural Economics U [0.50]**

The application of economic theory and various contemporary tools of economic analysis in solving production problems in the agricultural sector of the economy.

*Department(s):* Department of Food, Agricultural and Resource Economics

### **FARE\*6720 Readings in Agricultural Economics F,S,W [0.50]**

A reading course on selected topics of special interest. May be offered to individual students or to groups of students in any semester.

*Department(s):* Department of Food, Agricultural and Resource Economics

### **FARE\*6800 Seminar in Agricultural Economics U [0.00]**

Students in the MSc and MFARE major research paper option program must give two presentations at the annual research symposium; one in their first year outlining their research plan, and one in their second year on their thesis research results or major research paper.

*Department(s):* Department of Food, Agricultural and Resource Economics

## Food Safety and Quality Assurance

The interdepartmental program is the focal point for graduate teaching and research in food safety and quality assurance. The MSc program in food safety and quality assurance is intended to prepare food scientists, food engineers, veterinarians and others with appropriate scientific backgrounds for participation in food safety monitoring and maintenance in the food industry and in government. Students wishing to undertake graduate studies at the MSc level with emphasis on food safety and quality assurance will enter the program through a participating department. The participating academic units are Biomedical Sciences, Marketing and Consumer Studies, Environmental Biology, Food Science, Pathobiology, Population Medicine, and Engineering.

### Administrative Staff

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Professor, Food Science

### Associated Graduate Faculty

#### Mansel Griffiths

Food Science

#### Anne Wilcock

Food Science

## MSc Program

### Admission Requirements

The program is most suitable for those with an undergraduate science background or for those currently employed in the food area in government regulatory work or in the processing industry who desire upgrading of skills and knowledge. Applicants for admission to this program must meet the university minimum admission requirement of a baccalaureate in an honours program (or the equivalent) or a DVM from a recognized university or college with an average standing of at least a 'B-' average. Applicants will be expected to have completed undergraduate courses that prepare them for participation in the core graduate courses and electives of the program. Undergraduate upgrading may be necessary to ensure sufficient background in topics such as microbiology, toxicology, statistics, and analytical methods.

### Degree Requirements

Completion of the MSc FSQA program requires a minimum of eight courses (or 4.5 credits) acceptable for graduate credit. This includes the seminar course which has a value of 0.5 credit. All students must complete:

FSQA*6000	[0.50]	Food Safety and Quality Assurance Seminar
FSQA*6500	[1.00]	Food Safety and Quality Assurance Research Project
This project is equal to 1.0 credit and counts as one course of the eight required courses.		
FSQA*6600	[0.50]	Principles of Food Safety and Quality Assurance
FSQA*6150	[0.50]	Food Quality Assurance Management

At least four additional courses, in consultation with the student's advisory committee.

Suitable courses are listed below. Other courses, not listed here, also may be considered. Up to two senior undergraduate courses can be taken. The courses selected will depend upon the student's background, specialty, interest and area of project research. The normal duration of the program will be three to four full-time semesters.

### Graduate Diploma

### Admission Requirements

The program is most suitable for those with an undergraduate science background or for those currently employed in the food area in government regulatory work or in the processing industry who desire upgrading of skills and knowledge. Applicants for admission to this program must meet the university minimum admission requirement of a baccalaureate in an honours program (or the equivalent) or a DVM from a recognized university or college with an average standing of at least a 'B-' average. Applicants will be expected to have completed undergraduate courses that prepare them for participation in the core graduate courses and electives of the program. Undergraduate upgrading may be necessary to ensure sufficient background in topics such as microbiology, toxicology, statistics, and analytical methods.

### Diploma Requirements

All students must complete the following five courses:

FSQA*6100	[0.50]	Food Law and Policy
FSQA*6150	[0.50]	Food Quality Assurance Management
FSQA*6200	[0.50]	Food Safety Systems Management
FSQA*6600	[0.50]	Principles of Food Safety and Quality Assurance
POPM*6350	[0.50]	Safety of Foods of Animal Origins

### Collaborative Specializations

### Toxicology

The MSc in Food Safety and Quality Assurance participates in the collaborative specialization in toxicology. The faculty members' research and teaching expertise includes aspects of toxicology; they may serve as advisors for MSc.

Please consult the Toxicology listing for a detailed description of the MSc collaborative specialization.

### Courses

FSQA*6000 Food Safety and Quality Assurance Seminar F [0.50]	
Provides experiential training in forms of communication that are likely to be required in professional or academic careers in food science and technology.	
<i>Restriction(s):</i>	This course is open only to students in the MSc FSQA program.
<i>Department(s):</i>	Department of Food Science
FSQA*6100 Food Law and Policy F [0.50]	
The fundamentals of food policy development and Canadian and international food law are learned and practiced through online presentations, independent study and online interactions with other students and industry professionals.	
<i>Offering(s):</i>	Offered through Distance Education format only.
<i>Department(s):</i>	Department of Food Science

<b>FSQA*6150 Food Quality Assurance Management W [0.50]</b>
Examination and review of principles and concept of quality assurance and their application to consumer products and services. Topics include applied aspects of total-quality management principles. <i>Offering(s):</i> Offered through Distance Education format only. <i>Department(s):</i> Department of Food Science
<b>FSQA*6200 Food Safety Systems Management W [0.50]</b>
Food safety systems are studied in four modules. (1) A brief review of plant hygiene and HACCP principles. Students with insufficient background will do supplemental study in these areas; (2) HACCP implementation and verification; (3) HACCP-based food safety programs in Canada; and (4) International Food Safety Management Systems. <i>Offering(s):</i> Offered through Distance Education format only. <i>Department(s):</i> Department of Food Science
<b>FSQA*6500 Food Safety and Quality Assurance Research Project S,F,W [1.00]</b>
An original research project related to food safety and quality assurance which includes the preparation of a written report suitable for publication and an oral presentation of the findings to the graduate faculty. <i>Department(s):</i> Department of Food Science
<b>FSQA*6600 Principles of Food Safety and Quality Assurance F [0.50]</b>
An integrated approach to factors affecting food safety and quality including microbial and chemical contamination is provided. Major food-borne disease outbreaks are studied as examples. Modern methods of quality management to minimize contamination of processed foods is discussed. <i>Offering(s):</i> Offered through Distance Education format only. <i>Department(s):</i> Department of Food Science

### Other Graduate Courses Suitable for Credit in this Program

#### Food Science

FOOD*6190	[0.50]	Advances in Food Science
FOOD*6710	[0.25]	Special Topics in Food Chemistry
FOOD*6720	[0.25]	Special Topics in Food Microbiology
FOOD*6730	[0.25]	Special Topics in Food Physics
FOOD*6740	[0.25]	Special Topics in Food Processing
FOOD*6750	[0.25]	Special Topics in Food for Health
FOOD*6760	[0.25]	Special Topics in Food Quality

#### Human Health and Nutritional Sciences

HHNS*6400	[0.50]	Functional Foods and Nutraceuticals
HHNS*6410	[1.00]	Applied Functional Foods and Nutraceuticals

#### Pathobiology

PABI*6000	[0.50]	Bacterial Pathogenesis
PABI*6550	[0.50]	Epidemiology of Zoonoses

#### Population Medicine

POPM*6200	[0.50]	Epidemiology I
POPM*6210	[0.50]	Epidemiology II
POPM*6350	[0.50]	Safety of Foods of Animal Origins

#### Plant Agriculture

PLNT*6110	[0.50]	Fruit and Vegetable Technology
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### Undergraduate Courses Suitable for Credit in this Program

#### Food Science

FOOD*3030	[0.50]	Food Chemistry I
FOOD*4120	[0.50]	Food Analysis
FOOD*4090	[0.50]	Functional Foods and Nutraceuticals

#### Human Health and Nutritional Sciences

NUTR*4510	[0.50]	Toxicological Aspects of Nutrition
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#### Population Medicine

POPM*4040	[0.50]	Epidemiology of Food-Borne Diseases
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## Food Science

Food Science is the study of scientific and technological principles applied to the processing, preservation, packaging, distribution, handling, storage and evaluation of food products. It is an applied science, drawing heavily upon the principles of chemistry, engineering and microbiology. Research-based MSc and PhD thesis programs have existed in the Department of Food Science since its creation from the Department of Dairy Science in 1967 and are offered in the fields of:

- Food Chemistry
- Food Processing
- Food Microbiology

The Food Science program at Guelph is the only one of its kind in Ontario and over the years has trained a large percentage of the Food Scientists currently employed in the Ontario food industry. In 1992, a course-based MSc in Food Safety and Quality Assurance was developed by Food Science with several other departments at the University of Guelph. In 2010, a Graduate Diploma in Food Safety and Quality Assurance was introduced. The diploma is available only online. For more details please consult the FSQA program

### Administrative Staff

#### Chair

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### Graduate Faculty

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#### Jeffrey Farber

BSc, MSc, PhD McGill - Professor

#### H. Douglas Goff

BSc (Agr) Guelph, MS, PhD Cornell - Professor

#### Arthur R. Hill

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#### Iris Joye

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#### Loong-Tak Lim

BSc Acadia, PhD Guelph - Associate Professor

#### Alejandro G. Marangoni

BSc McGill, PhD Guelph - Professor, Canada Research Chair

#### Massimo F. Marcone

BSc, PhD Guelph - Professor

#### Donald Mercer

BSc, PhD Waterloo - Associate Professor

#### Yoshinori Mine

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#### Michael Rogers

BSc, MSc, PhD Guelph - Associate Professor

#### Paul Spagnuolo

BSc, MSc Guelph, PhD Waterloo - Associate Professor

#### Keith Warriner

BSc Nottingham, PhD Aberystwyth - Professor

### MSc Program

The objective of this program is to provide graduates with general scientific knowledge as well as a more in-depth understanding of particular aspects of Food Science. The MSc program is offered in the fields of: 1) food chemistry; 2) food processing; and 3) food microbiology.

This objective is accomplished through course work and departmental research seminars. Extensive laboratory and technical training is obtained by performing experiments under the supervision of a professor and advisory committee. A mandatory communication course also teaches effective oral and written communication. All these training aspects culminate through the writing of the MSc thesis. With this background, MSc graduates will be qualified to obtain positions with responsibility in government and the research, development and production sectors of the food and beverage industry.

### Admission Requirements

To be considered for admission, applicants should hold an honours baccalaureate degree with at least a 'B' average during the last two years of study. Supportive letters of reference are essential and should outline the applicant's strengths and weaknesses. Students whose first language is not English require a TOEFL score of at least 550 (paper-based), 213 (computer-based), or 89 (internet-based). To assist in identifying a suitable thesis advisor, applicants should submit a short statement of research interests. Admission into the department is contingent on the student obtaining a scholarship or Graduate Research Assistantship. Students may be admitted into the Fall, Winter or Summer semesters.

### Degree Requirements

MSc students are required to register in at least three graduate courses, plus seminar (a minimum of 2.0 credits) and prepare an acceptable thesis. A graduate degree program form signed by the student and approved by the student's advisory committee will be submitted during the first semester for approval of the departmental Graduate Program Committee. The student must maintain a minimum 'B-' average to remain in the program. Each student is required to take a compulsory seminar course which provides training in technical communications. The thesis research is planned by the student in consultation with the advisor and approved by the advisory committee during the first semester of the program. The program is completed by the successful defense of the thesis.

### PhD Program

The objective of this program is to develop highly competent scientists who will provide leadership in academic institutions, or as managers in Food Science research and development institutes in industry or government. The PhD program is offered in the fields of: 1) food chemistry; 2) food processing; and 3) food microbiology. Creativity and the ability to perform independent research is fostered by requiring PhD students to submit a written research proposal and defend it orally. Having obtained research skills during their MSc studies, PhD students are expected to conduct autonomous research. The preparation of a PhD thesis and scientific publications ensures that graduates have attained prowess in research and communication.

### Admission Requirements

The usual requirement for admission into the PhD program is a research-based MSc degree with a minimum 'B' average and supportive letters of reference. Students whose first language is not English require a TOEFL score of at least 550 (paper-based), 213 (computer-based), or 89 (internet-based).

To assist in identifying a suitable thesis advisor, applicants should submit a short statement of research interests. Admission into the department is contingent on the student obtaining a scholarship or GRA. It is also possible for a student to transfer from the MSc program without completing a master's thesis if the student has an excellent academic record and shows a strong aptitude for research which can be expanded to the doctoral level. Students may be admitted into the Fall, Winter or Summer semesters.

### Degree Requirements

The major emphasis in the PhD program is research and the preparation of an acceptable thesis. There are no specific course requirements except for a course which is designed to ensure that the PhD candidates have adequate background knowledge in Food Science (food chemistry, food microbiology and food processing/engineering), as well as adequate written and oral communication skills. It is usual however for most students, in consultation with their advisory committee, to select prescribed studies and additional courses in preparation for the qualifying examination and thesis research. The qualifying examination is in two parts: (1) submission of research proposal; and (2) oral examination that evaluates the student's ability to communicate effectively the scientific principles and put the proposed research to submit a written evaluation of the student's performance to date in research and the student's potential as a researcher. The PhD program is completed by the submission and successful defense of an acceptable thesis.

### Courses

#### Note

Course content for "Special Topics" will vary according to the research interests of the faculty involved in offering the course. Specific course descriptions are posted on the Department of Food Science website.

## General

### **FOOD\*6190 Advances in Food Science U [0.50]**

Topics of current research interest and importance are examined. A project supervised by a faculty member is undertaken, the topic of which is chosen after considering the interests of the student.

*Department(s):* Department of Food Science

### **FOOD\*6300 Food Science Communication U [0.50]**

This course provides experiential training in forms of communication that are likely to be required in professional or academic careers in food science and technology.

*Restriction(s):* This course is only open to students in the MSc Food program.

*Department(s):* Department of Food Science

### **FOOD\*6710 Special Topics in Food Chemistry U [0.25]**

This is a modular course in which several faculty members lecture and/or lead discussions in current topics in food chemistry. Students will complete an independent review in the area of food chemistry, participate in discussions, complete case studies, and present talks related to food chemistry.

*Department(s):* Department of Food Science

### **FOOD\*6720 Special Topics in Food Microbiology U [0.25]**

This is a modular course in which several faculty members lecture and/or lead discussions in current topics in food microbiology. Students will complete an independent review in the area of food microbiology, participate in discussions, complete case studies, and present talks related to food microbiology.

*Department(s):* Department of Food Science

### **FOOD\*6730 Special Topics in Food Physics U [0.25]**

This is a modular course in which several faculty members lecture and/or lead discussions in current topics in food physics. Students will complete an independent review in the area of food physics, participate in discussions, complete case studies, and present talks related to physics in foods.

*Department(s):* Department of Food Science

### **FOOD\*6740 Special Topics in Food Processing U [0.25]**

This is a modular course in which several faculty members lecture and/or lead discussions in current topics in food processing. Students will complete an independent review in the area of food processing, participate in discussions, complete case studies, and present talks related to conventional and emerging methodologies for the processing of foods.

*Department(s):* Department of Food Science

### **FOOD\*6750 Special Topics in Food for Health U [0.25]**

This is a modular course in which several faculty members lecture and/or lead discussions in current topics in food for health. Students will complete an independent review in the area of food and health, participate in discussions, complete case studies, and present talks related to the impact of food for health.

*Department(s):* Department of Food Science

### **FOOD\*6760 Special Topics in Food Quality U [0.25]**

This is a modular course in which several faculty members lecture and/or lead discussions in current topics in food quality. Students will complete an independent review in the area of food quality, participate in discussions, complete case studies, and present talks related to quality of foods.

*Department(s):* Department of Food Science

### **FOOD\*6770 PhD Research Writing in Food Science F,W [0.50]**

PhD Research Writing in Food Science provides experiential training in forms of communication that are likely to be required in professional or academic careers, helps PhD students position their research in the broader context of Food Science and Technology, and helps prepare students for the qualifying examination.

*Restriction(s):* Only for Ph.D. students in Food Science Instructor consent required.

*Department(s):* Department of Food Science

### **Other Graduate Courses:**

HHNS\*6410 Applied Functional Foods and Nutraceuticals

PLNT\*6110 Fruit and Vegetable Technology

## French

The French MA program is designed for students who wish to pursue careers in post-secondary teaching, research, administration, federal and provincial government service, national and international organisations, and other areas in which advanced bilingual and multicultural skills are required. This program highlights the converging and diverging historical and linguistic forces at play in cultural environments that share French as a common language.

Research and teaching fall within two main fields:

- Language in Context
- Politics and Aesthetics of Literatures

### Administrative Staff

#### Acting Director

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### Graduate Faculty

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#### Donald Bruce

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#### Margot Irvine

BA, MA, PhD Toronto - Associate Professor

#### Stéphanie Nutting

BA Toronto, MA, PhD Queen's - Associate Professor

#### Joubert Satyre

BA État d'Haïti, MEd, PhD Montréal - Associate Professor

#### Clive Thomson

BA Trinity College, MA, PhD Toronto - Professor and Director of SOLAL

### MA Program

The MA program is offered in two main fields 1) language in context; and 2) politics and aesthetics of literatures. Students may take a range of courses in Quebec, continental French, African and Caribbean literatures, as well as in intermediality, literary translation, sociolinguistics and the pedagogy of French as a second language.

This program offers an experiential service-learning practicum which takes place outside the classroom. Students choose from a list of volunteer activities approved by the School of Languages and Literatures. This practicum normally takes place in a Francophone milieu and is the equivalent of one academic course (0.5 credit).

### Admission Requirements

The normal requirement for admission to the French MA program is the equivalent of an Honours degree in French studies from a recognized post-secondary institution with an overall average of B+ or equivalent. Applicants who do not have an Honours BA in French from a Canadian university may be required to take a short competence test and/or qualifying undergraduate courses prior to beginning graduate study. Students enter the program in September with full-time status.

### Degree Regulations

Students are required to take a minimum of six semester courses (3.0 credits), with the service-learning placement counting as one of these courses. They are also required to write a 40 page MRP (major research paper). Courses must be approved by the Graduate Program Coordinator and will normally be completed in four semesters on a full-time basis. The minimum average required for graduation from the program is a B or equivalent. All work is written in French.

Required courses:

FREN*6000	[0.50]	Research Methods Seminar
FREN*6042	[0.50]	Topics in FSL Pedagogy

### Courses

The content of the courses listed below will vary according to the research interests of the faculty involved in offering the course. Specific course descriptions for a particular offering of the course will be available from the Graduate Program Coordinator in advance of the course being offered.

#### FREN\*6000 Research Methods Seminar F [0.50]

This course will introduce students to the field and research methods of various disciplines and of interdisciplinary studies, and it will familiarize them with field-relevant research skills and methodologies.

*Department(s):* School of Languages and Literatures

#### FREN\*6020 Topics in French Literature U [0.50]

This course will focus on European French literature in relation to thematic approaches including: gender and feminism, transgression, (post)colonialisms, identity and alterity.

*Department(s):* School of Languages and Literatures

#### FREN\*6021 Topics in Quebec and French-Canadian Literatures U [0.50]

This course will focus on how literature functions as a socio-political institution in Quebec and in French Canada. It will also deal with elements that relate more broadly to identity, reception theory and semiotics.

*Department(s):* School of Languages and Literatures

#### FREN\*6022 Topics in Caribbean and African Literatures U [0.50]

This course focuses on the works of major Francophone African and Caribbean fictional and theoretical works with particular attention being given to links between notions of cultural hierarchies, identity, métissage and creolization.

*Department(s):* School of Languages and Literatures

#### FREN\*6030 Topics in Translation U [0.50]

This course deals with various aspects of literary translation, including theories of translation, the role of reading in translation, the active translation of a text from English into French, and the reflection upon the influence of each of these categories on the others.

*Department(s):* School of Languages and Literatures

#### FREN\*6031 Topics in Intermediality U [0.50]

An investigation of the intersection of artistic expression taking place in literature, theatre, film, television and new media and the various effects produced by the interaction of two or more media.

*Department(s):* School of Languages and Literatures

#### FREN\*6041 Topics in French and French-Canadian Sociolinguistics U [0.50]

This course will allow students to explore, within the framework of sociolinguistics and applied linguistics, the relationship between language and society, with particular reference to French and the French-speaking world.

*Department(s):* School of Languages and Literatures

#### FREN\*6042 Topics in FSL Pedagogy U [0.50]

This compulsory course covers theories, methods, and real-life applications of the teaching/learning of a second language, specifically French.

*Department(s):* School of Languages and Literatures

#### FREN\*6050 Reading Course S [0.50]

An independent study course, the nature and content of which is agreed upon between the student and the professor offering the course. Subject to the approval of the graduate program coordinator.

*Department(s):* School of Languages and Literatures

#### FREN\*6051 Major Research Paper U [0.50]

This independent, required course allows students to pursue research in an area of particular interest to them in the field of French Studies. A compulsory major paper 40 pages in length will be required.

*Prerequisite(s):* FREN\*6000

*Department(s):* School of Languages and Literatures

#### FREN\*6053 Practicum in French Studies S [0.50]

This course will allow students to engage in volunteer service in a francophone community. Students will be asked to forge links between knowledge acquired in the academic setting and problem-based learning in a real-world context. A list of authorized community partners will be provided.

*Prerequisite(s):* FREN\*6000 and FREN\*6042

*Department(s):* School of Languages and Literatures

## Geography

The Department of Geography offers programs of study leading to the degrees of MA, MSc and PhD in the following fields:

- Environmental Management and Governance
- Biophysical Systems and Processes
- Socio-Economic Spaces and Change

Details regarding faculty, areas of research, current research opportunities are provided on the Department's web site <http://www.uoguelph.ca/geography/>

### Administrative Staff

#### Chair

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### Graduate Faculty

#### Lorne P. Bennett

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#### Aaron Berg

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#### Benjamin E. Bradshaw

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#### Kirby Calvert

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#### Jaclyn Cockburn

BSc, MSc, PhD Queen's - Assistant Professor

#### Evan Fraser

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#### Ze'ev Gedalof

BA, MSc Victoria, PhD Washington - Associate Professor

#### Noella Gray

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#### Roberta Hawkins

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#### John B. Lindsay

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#### Janet E. Mersey

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#### Kate Parizeau

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#### Robin Roth

BA Victoria, PhD Clark - Associate Professor

#### Jennifer Silver

BA Mount Allison, MA Western, PhD Simon Fraser - Assistant Professor

#### John A. Smithers

BA Western Ontario, MA, PhD Guelph - Professor and Chair

#### Wanhong Yang

BSc Hubei, MSc Chinese Academy of Sciences, PhD Illinois - Professor and Graduate Program Coordinator

### MA and MSc Programs

The Department of Geography offers MA and MSc degrees in Geography, by thesis and by project. The Master's program offers opportunities for research in the fields of 1) environmental management and governance; 2) biophysical systems and processes; and 3) socio-economic spaces and change. The program is distinctive in that it emphasizes interrelationships among biophysical and human systems. Scales of inquiry range from the local to the global, and students conduct research in both developed and developing countries.

### Admission Requirements

To be considered for admission, applicants should meet the minimum requirements of a four-year honours degree with a 75% ('B') average during the final two years of study. Applicants must submit a statement of their research interests with their application. It is essential that applicants contact potential advisors in the department prior to submission of an application. Students are admitted in September. Program offices should be consulted for admission deadlines.

### Degree Requirements

Students enrol in one of two study options: 1) thesis, or 2) course work and major research project.

#### Thesis

Students taking the thesis option are required to complete an acceptable thesis and the Research Methods courses (GEOG\*6090 and GEOG\*6091). In addition, students must take three courses (1.5 credits), from the Department of Geography.

For the MA degree, students must complete two courses identified as social science courses. For the MSc degree, students must complete two courses identified as natural science courses.

#### Course Work and Major Research Project (MRP)

Students taking the course work option must complete the Research Methods courses (GEOG\*6090 and GEOG\*6091) and the Research Project course. In addition, five other courses (2.5 credits) are required, at least four of which must be from the Department of Geography. MA students must complete three courses identified as social science courses. MSc students must complete three courses identified as natural science courses.

### PhD Program

The PhD program is offered in three fields 1) environmental management and governance; 2) biophysical systems and processes; and 3) socio-economic spaces and change. Doctoral students conduct research relating to these areas at various geographic scales, from the local to the global.

### Admission Requirements

Applicants for the PhD program should have a recognized master's degree with an 80% ('A-') average in their postgraduate studies. Applicants must submit a statement of their research interests including some evidence of experience in their chosen research area. It is essential that applicants contact potential advisors in the department prior to submission of an application. Students are admitted in September. Program offices should be consulted for admission deadlines.

### Degree Requirements

All students in the PhD program are required to complete the Geographic Scholarship and Research course during the first two semesters of study. The advisory committee may prescribe additional courses to help the student prepare for the qualifying examination and thesis research. All students in the PhD program must complete a qualifying examination and submit a satisfactory research proposal by the end of the fourth semester of study.

The qualifying examination has written and oral components and evaluates the student's knowledge of the broader scholarly field as well as the specific theoretical and empirical content of the intended research area. Submission and defence of an acceptable thesis on an approved topic completes the requirements of the PhD.

### Collaborative Specializations

#### International Development Studies

The Department of Geography participates in the MA, MSc and PhD collaborative specialization in International Development Studies (IDS). Consult the International Development Studies listing for a detailed description of the requirements of the collaborative specialization.

### Courses

#### Environmental Management and Governance

##### GEOG\*6281 Environmental Management and Governance F [0.50]

Analysis and evaluation of environmental management and governance using geographical approaches. Emphasis is on socio-economic theories, concepts and methods which offer a more comprehensive and integrative basis for understanding environmental decisions.

*Restriction(s):* Signature required for non-geography students.

*Department(s):* Department of Geography

##### GEOG\*6340 Human-Environment Relations W [0.50]

A critical review of philosophies, concepts and analytical methods for analysis and management of systems involving the interaction of environmental processes and human spatial activity.

*Department(s):* Department of Geography

#### Biophysical Systems and Processes

##### GEOG\*6330 Biotic Processes and Biophysical Systems U [0.50]

Investigation of biotic processes influencing the composition, structure and distribution of plant and animal communities and of approaches to biophysical systems analysis, focusing on environmental system interaction at the landscape scale.

*Department(s):* Department of Geography

**GEOG\*6550 Environmental Modelling W [0.50]**

This course aims to provide students with an understanding of the processes and techniques involved in environmental modeling practice and will focus on the power and limitations of existing models.

*Department(s):* Department of Geography

**GEOG\*6610 Global Hydrology F [0.50]**

An examination of global environmental hydrology including precipitation, evaporation, subsurface water and runoff. Physical processes, measurement, analytical techniques and modelling strategies will be considered in the context of global change.

*Department(s):* Department of Geography

**Socio-Economic Spaces and Changes****GEOG\*6400 Urbanization and Development U [0.50]**

Analysis of the evolution of urban form and pattern in the developing world within the context of the global urban system. Examines national urban systems and implications for dispersed development and rural change.

*Offering(s):* Offered in alternate years.

*Department(s):* Department of Geography

**GEOG\*6450 Development Geography U [0.50]**

Group identities at various scales in relation to concepts of territory and territoriality, and their changing impact on the world's political map.

*Offering(s):* Offered in alternate years.

*Department(s):* Department of Geography

**General****GEOG\*6060 Special Topics in Geography S,F,W [0.50]**

A course on some specific topic not covered by the regular graduate courses for which there are both available faculty and sufficient interest among students.

*Restriction(s):* Instructor consent required.

*Department(s):* Department of Geography

**GEOG\*6090 Geographical Research Methods I F [0.50]**

A review of philosophies and research methods in geography. The development and presentation of a context paper for the thesis or research project.

*Department(s):* Department of Geography

**GEOG\*6091 Geographical Research Methods II W [0.50]**

A review of philosophies and research methods in geography. The development and presentation of a research proposal for the thesis or research project.

*Prerequisite(s):* GEOG\*6090

*Department(s):* Department of Geography

**GEOG\*6100 Geographic Scholarship and Research F-W [0.50]**

A review of geographic scholarship including conceptual, theoretical and methodological issues in resource assessment, biophysical resources and rural socio-economic resources.

*Offering(s):* The course extends over two semesters (Fall and Winter).

*Department(s):* Department of Geography

**GEOG\*6180 Research Project in Geography S,F,W [1.00]**

The preparation and presentation of a report on the research project approved in GEOG\*6090.

*Restriction(s):* Instructor consent required.

*Department(s):* Department of Geography

## History - Tri-University Program

The Departments of History of the University of Guelph, the University of Waterloo and Wilfrid Laurier University offer a joint program leading to the MA and PhD degrees. The PhD program is offered in the following fields:

- Canadian History
- Scottish History
- War and Society
- World History
- Medieval History
- Early Modern European History
- Modern European History
- Cold War History
- Indigenous Histories of Turtle Island

The Tri-University Graduate Program in History includes members from all three departments covering a wide range of research interests. It is a semi-autonomous program responsible directly to the three graduate schools. It looks after admissions, arranges courses of instruction, names students' advisory committees, and monitors student progress generally. Students in the Tri-University Graduate Program in History register either at Guelph, Waterloo or Wilfrid Laurier (depending on where their advisor is located) but undertake their course work jointly at all three universities. Students in the program are governed by the general regulations of the university in which they are registered and their degree is granted by that university.

The department at Guelph also participates in the Centre for Scottish Studies and the Historical Data Research Unit. Students are encouraged to begin their studies in the Fall or Winter semesters. Program offices should be consulted for submission deadlines.

### Administrative Staff - Tri-University Program

#### Director

Adam Crerar (4-149 DAWB - Laurier, Ext. 3292)  
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#### Tri-University Secretary

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#### Graduate Program Coordinator

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#### Graduate Program Coordinator

Susan Nance (starting July 1, 2017) (2008 MacKinnon Extension, Ext. 56327)  
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### Graduate Faculty

#### Note

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#### Tara H. Abraham \*

BSc McMaster, MA, PhD, IHPST Toronto - Associate Professor

#### Catherine Carstairs \*

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#### Bill Cormack \*

BA Calgary, MA Carleton, PhD Queen's - Associate Professor

#### Elizabeth L. Ewan \*

BA Queen's, PhD Edinburgh - Professor and University Research Chair

#### James Fraser \*

BA Toronto, MA Guelph, Ph.D. Edinburgh - Associate Professor and Scottish Studies Foundation Chair

#### Peter A. Goddard \*

BA, UBC, DPhil Oxford - Associate Professor

#### Alan Gordon \*

BA Toronto, MA, PhD Queen's - Professor

#### Matthew C. Hayday \*

BA Toronto, MA, PhD Ottawa - Professor and Graduate Program Coordinator (until June 30, 2017)

#### Susannah C. Humble Ferreira \*

BA Trent, BEd Queen's, MA, PhD Johns Hopkins - Associate Professor

#### Kris E. Inwood \*

BA Trent, MA, PhD Toronto - Professor (Joint appointment with Department of Economics and Finance)

#### Kevin J. James \*

BA, MA McGill, PhD Edinburgh - Professor

#### Femi Kolapo \*

BA, MA Ahmadu Bello, PhD York - Associate Professor

#### Sofie Lachapelle \*

BSc, Montreal, PhD Notre Dame - Professor

#### Brittany Luby \*

BA Queen's, MA, PhD York - Assistant Professor

#### Linda L. Mahood \*

BA Saskatchewan, M Litt, PhD Glasgow - Professor

#### Stuart G. McCook \*

BA Toronto, MS Rensselaer PI, MA, PhD Princeton - Associate Professor

#### Alan McDougall \*

BA, MSt, DPhil Oxford - Professor

#### Jacqueline Murray \*

BA British Columbia, MA, PhD Toronto - Professor

#### Susan Nance \*

BA, MA Simon Fraser, PhD California (Berkeley) - Professor and Graduate Program Coordinator (starting July 1, 2017)

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#### Karen Racine \*

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#### Norman D. Smith \*

BA, MA, PhD British Columbia - Professor

#### Catharine A. Wilson \*

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#### Renée Worringer \*

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### Graduate Faculty from Wilfrid Laurier University

#### Kim Anderson

PhD Guelph

#### Gavin Brockett

PhD Chicago

#### Tarah Brookfield

PhD York

#### Blaine Chiasson

PhD Toronto

#### Cynthia Comacchio

PhD Guelph

#### Adam Crerar

PhD Toronto

#### Darryl Dee

PhD Emory

#### Peter Farrugia

DPhil Oxon

#### Judith Fletcher

PhD Bryn Mawr

#### Leonard G. Friesen

PhD Toronto

#### Jeff Grischow

PhD Queen's

#### Erich Haberer

PhD Toronto

#### Christina Han

PhD Toronto

#### Mark Humphries

PhD Western University

#### Robert Kristofferson

PhD York

**Lianne Leddy**  
PhD Wilfrid Laurier University

**Amy Milne-Smith**  
PhD Toronto

**David Monod**  
PhD Toronto

**Darren Mulloy**  
PhD East Anglia

**Susan Neylan**  
PhD UBC

**Chris Nighman**  
PhD Toronto

**Eva Plach**  
PhD Toronto

**Roger Sarty**  
PhD Toronto

**Michael D. Sibal**  
PhD Concordia

**David Smith**  
PhD Harvard

**Kevin Spooner**  
PhD Carleton

**Gary Warrick**  
PhD McGill

**Dana Weiner**  
PhD Northwestern

**Suzanne Zeller**  
PhD Toronto

## Graduate Faculty from the University of Waterloo

**Steven Bednarski**  
BA Glendon/York, MA Toronto, PhD Québec à Montréal

**James Blight**  
BA Michigan, MA, PhD New Hampshire

**Gary Bruce**  
BA Queen's, MA New Brunswick, PhD McGill

**Marlene Epp**  
BA Manitoba, MA Waterloo, PhD Toronto

**Daniel Gorman**  
BA St. Francis Xavier, MA Queen's, PhD McMaster

**Kimie Hara**  
BA Kobe City, MA Hawaii, PhD Australian National University

**Geoff W. Hayes**  
BA, MA Laurier, PhD Western Ontario

**Andrew Hunt**  
BA, PhD Utah

**Greta Krocker**  
BA Bethel College, MA Missouri, PhD California at Berkley

**Whitney Lackenbauer**  
BA Waterloo, MA, PhD Calgary

**Heather A. MacDougall**  
BA, MA, PhD Toronto

**Ian Milligan**  
MA, PhD (York)

**Wendy L. Mitchinson**  
BA, MA, PhD York

**Bruce Muirhead**  
BA Queen's, MA Toronto, PhD York

**Troy Osborne**  
BA Goshen, MA Mennonite Biblical Seminary, PhD Minnesota

**Douglas Peers**  
BA, MA Calgary, PhD London, King's College

**Julia Roberts**  
BA Laurier, MA Waterloo, PhD Toronto

**Susan Roy**  
MA Simon Fraser, PhD UBC

**John Sbardellati**  
BA California at Riverside, MA, PhD California at Santa Barbara

**Alex Statiev**  
BSc Moscow, MA, PhD Calgary

**Lynne Taylor**

BA Western Ontario, MA London, PhD Michigan

**Ryan Touhey**  
BA, MA Ottawa, PhD Waterloo

**James W. Walker**  
BA Toronto, MA Waterloo, PhD Dalhousie

## MA Program

The MA program provides for emphasis on the Atlantic world, the history of crime, culture and entertainment, family and youth, gender and sexuality, health and nutrition, imperialism, indigenous history, military history, politics and international relations, religious history, rural history urban history, the history of science and the environment and tourism history.

## Admission Requirements

An applicant must have a recognized honours degree in history, or its equivalent, with at least a 'B' average. Applicants are required to include with their application a separate statement describing their proposed area of study and, where possible, the suggested thesis topic.

## Degree Requirements

Students enrol in one of two study options 1) thesis, or 2) course work and major research paper or course work.

### Thesis

Students must complete four courses (at least 2.0 credits) and submit a satisfactory thesis on an approved topic (25,000 words).

### Course Work and Major Paper

Students must satisfactorily complete six courses (at least 3.0 credits) and submit a major paper on an approved topic (10,000 to 12,000 words).

### Course Work

Students must complete 8 courses (at least 4 credits) three of which must require a research paper.

It is recommended but not required that students take HIST\*6000 and HIST\*6020. The remaining courses are subject to the approval of the Department of History. A reading knowledge of French is highly recommended and a student's advisory committee may require a second language for research purposes. MA students generally register for up to three courses per semester, or two if they hold a graduate teaching assistantship.

Graduate students are encouraged to consider including, as part of their program, appropriate graduate course offerings from other departments.

## Interdepartmental Programs

### Scottish Studies Interdepartmental Group

The Department of History participates in the activities of the Centre for Scottish Studies. Those faculty members whose research and teaching expertise includes aspects of Scottish studies may serve as advisors and examiners of MA students specializing in Scottish studies areas and who are registered in the Department of History.

## PhD Program

The Tri-University Doctoral Program generally limits thesis preparation to nine fields of study: 1) Canadian history; 2) Scottish history; 3) early modern European history; 4) modern European history; 5) Medieval history; 6) Cold War Era history; 7) war and society; 8) World history, and 9) Indigenous Histories of Turtle Island. The Tri-University History doctoral program is committed to the pursuit of excellence in graduate research and teaching. Students enter the doctoral program for a variety of reasons, but all are motivated by a strong desire to pursue the most advanced education for history teaching and research. In the first year of the program, students normally complete their three PhD fields. As PhD field preparation provides a wide intellectual basis for scholarship and teaching, the fields are designed in such a way as to encourage reading complementary to a student's proposed area of doctoral research. Field seminar discussions are intended to develop skills in critical analysis and historical synthesis. Through the process of completing required research papers and a doctoral thesis, students acquire the capacity to conduct independent research and to produce written work of a sufficient standard to be acceptable for scholarly publication.

As students are required to demonstrate competence in one major field and two minor fields, in first year they register in a major field seminar and two minor field seminars. One minor field must be in an area of study distinct from the major field and one minor field may be in another discipline. The distinction between a major field and an area of concentration is the depth and required range of reading rather than geographical or chronological span.

The PhD fields, written major field examination, and oral qualifying examination must be completed by the end of the fourth semester. No extensions will be permitted, except in cases where approval has been given by the Tri-University Program co-ordinating committee. Continuation in the program requires at least a B+ average, based on all courses taken in the program to that point (with their proportionate weighting).

All students have an advisory committee that meets regularly. Following successful completion of the qualifying process, the student must complete, under the supervision of a Tri-University Doctoral Program in History faculty member, an original research project on an advanced topic. Students present a thesis proposal and colloquium which are appraised by their advisory committees. A thesis embodying the results of that research is presented and defended before an examining committee.

### Admission Requirements

Applications are considered by the Tri-University co-ordinating committee. Only students who are graduates of accredited universities and colleges are eligible for admission. Direct admission following a BA degree is permissible for outstanding applicants, but normally students will be admitted after they have obtained an MA in which they have received at least an A- standing. Since not all applicants can be admitted, close attention is paid to samples of applicants' written work, to applicants' transcripts and past records as a whole, and to their statements of research interests. Applicants from outside Canada whose previous education cannot be assessed readily may be required to demonstrate their knowledge by other means, such as the Graduate Record Examination. Non-Canadian applicants whose first language is not French or English are required to submit evidence of proficiency in the English language or pass the Test of English as a Foreign Language (TOEFL). A net score of 600 is required. Registration at one university for three degrees (BA, MA, PhD) is discouraged.

### Degree Requirements

1. Professional Development Seminar (HIST\*7000). All doctoral students attend the professional development seminar in their first year of the program. The seminar is designed to prepare students for success as a PhD student and for their future careers. A pass/fail grade will be assigned for the seminar.
2. Language requirement. If no specific language is required for the student's research (as authorized by the student's advisory committee), the second language will be French. The determination of the second language will be made by the student's advisory committee during the first semester of the student's registration in the program. The language exam will be offered every Fall and Winter semester and it is expected that a student will successfully complete the test of reading comprehension no later than the 6th semester following admission into the program.
3. PhD fields. Each student is required to demonstrate competency in one major and two minor areas. In the minor fields, competency is demonstrated by successful completion of two minor field seminars. In the major field, students must successfully complete a major field seminar and the qualifying written and oral examinations (HIST\*7040 and HIST\*7010). See the Tri-University History doctoral handbook. Students enrolled in the PhD collaborative specialization in International Development may substitute the two core IDS PhD courses (IDEV\*6800 and IDEV\*6850) for one of their minor field seminars.
4. Colloquium (HIST\*7080). The colloquium is a public presentation of a chapter, significant portion, or summary of the student's thesis within three semesters of the completion of the thesis proposal. Grades will be SAT/UNS.
5. Thesis proposal (HIST\*7070). The thesis proposal is a written (The expected length is approximately 3,000 words, excluding notes and the bibliography) and oral demonstration for dissertation research. The proposal will include a statement of the overall thesis of the dissertation, a description/discussion of the major research question(s), a review of the principal primary/archival sources being used, a chapter or topic outline, and a clear explanation of the originality of the thesis. Grades will be SAT/UNS.
6. PhD thesis (HIST\*7990). All students must complete, under the supervision of a tri-university doctoral program faculty member, an original research project on an advanced topic. Each student will be required to write and successfully defend a thesis of such cogency and originality as will represent a significant contribution to knowledge. The thesis will normally be between 50,000 and 90,000 words in length. University of Guelph regulations and procedures govern this process (see Degree Regulations).

### Collaborative Specializations

#### International Development Studies

The Department of History participates in the International Development Studies (IDS) collaborative specialization. Please consult the International Development Studies listing for a detailed description of the MA/PhD collaborative specialization including the special additional requirements for each of the participating departments.

#### Courses - MA

##### Note

For the courses offered in a particular year, see the listing published by the Office of Registrarial Services.

### Canadian History

#### HIST\*6230 Canada: Culture and Society U [0.50]

A course that examines the current historiography of selected aspects of Canadian history. Topics will vary with the expertise of individual instructors.

*Department(s):* Department of History

#### HIST\*6231 Canada: Culture and Society Research U [0.50]

Continuation of HIST\*6230 in which students prepare an indepth research paper based on primary sources.

*Department(s):* Department of History

#### HIST\*6280 Canada: Community and Identity U [0.50]

A course that examines the current historiography of selected aspects of Canadian history. Topics will vary with the expertise of individual instructors.

*Department(s):* Department of History

#### HIST\*6281 Canada: Community and Identity Research U [0.50]

Continuation of HIST\*6280 in which students prepare an indepth research paper based on primary sources.

*Department(s):* Department of History

#### HIST\*6290 Topics in North American History U [0.50]

Depending on the expertise of the instructor, this course may concentrate on either the United States or Canada, or it may select an historical theme or themes common to the larger continent.

*Department(s):* Department of History

#### HIST\*6291 North American History Research U [0.50]

Continuation of HIST\*6290 in which students prepare an indepth research paper based on primary sources.

*Department(s):* Department of History

### Scottish History

#### HIST\*6150 Scottish Archival Research U [0.50]

This course will comprise of classroom teaching, practical instruction and work-placement within the Scottish Collection of the University of Guelph's Archives. It will introduce students to basic skills in the digitization of sources and teach competence in conservation, record creation and archival research.

*Restriction(s):* Student numbers are limited by the number of placements available in the University Archives.

*Department(s):* Department of History

#### HIST\*6190 Topics in Scottish History I U [0.50]

This course will introduce students to selected aspects of medieval and early modern Scottish history and historiography, including the use of source materials, and practical training involving manuscripts in the University Archives.

*Department(s):* Department of History

#### HIST\*6191 Scottish History I Research U [0.50]

Continuation of HIST\*6190 in which students prepare an in-depth research paper based on primary sources.

*Department(s):* Department of History

#### HIST\*6200 Scottish Highland and Lowland History U [0.50]

This course will introduce students to selected aspects of Scottish history and historiography considered from a Highlands perspective and a (sometimes significantly different) Lowlands perspective, including issues surrounding the selection and use of source materials, and provide practical training involving manuscripts in the University Archives.

*Restriction(s):* Instructor consent required.

*Department(s):* Department of History

#### HIST\*6201 Scottish Highland and Lowland Research U [0.50]

Continuation of HIST\*6200 in which students prepare an in-depth research paper based on primary sources.

*Restriction(s):* Instructor consent required.

*Department(s):* Department of History

### European History

#### HIST\*6300 Topics in Modern European History I U [0.50]

This seminar course will focus on selected aspects of the political and social history of Europe between 1789 and 1989. Topics to be examined will vary according to the expertise of the faculty and the interest of the students.

*Department(s):* Department of History

**HIST\*6301 Modern European History Research I U [0.50]**

Continuation of HIST\*6300 in which students prepare an in-depth research paper based on primary sources.

*Department(s):* Department of History

**HIST\*6310 Topics in Modern European History II U [0.50]**

This seminar course will focus on selected aspects of the political and social history of Europe between 1789 and 1989. Topics to be examined will vary according to the expertise of the faculty and the interest of the students.

*Department(s):* Department of History

**HIST\*6311 Modern Europe II Research U [0.50]**

Continuation of HIST\*6310 in which students prepare an in-depth research paper based on primary sources.

*Department(s):* Department of History

**HIST\*6380 Topics in Early Modern European History U [0.50]**

This seminar course examines current issues in early modern European history as selected by the instructor(s). Participants review current research and historiography, discuss the principal debates, and develop their own perspectives through encounters with primary source materials.

*Department(s):* Department of History

**HIST\*6381 Early Modern European History Research U [0.50]**

Continuation of HIST\*6380 in which students prepare an in-depth research paper based on primary sources.

*Department(s):* Department of History

**World History****HIST\*6500 Topics in Global History U [0.50]**

This is a topical course, that explores the history of processes that take place on a worldwide scale. These may include social, cultural, economic, or environmental processes.

*Department(s):* Department of History

**HIST\*6501 Global History Research U [0.50]**

Continuation of HIST\*6500 in which students prepare an in-depth research paper based on primary sources.

*Department(s):* Department of History

**HIST\*6520 Topics in Latin American History U [0.50]**

In-depth study of a particular event or process in Latin American history. Topics may include: religions, women, race and ethnicity, environment issues, intellectual history, or have a regional or temporal focus.

*Department(s):* Department of History

**HIST\*6521 Latin American History Research U [0.50]**

Continuation of HIST\*6520 in which students prepare an in-depth research paper based on primary sources.

*Department(s):* Department of History

**Thematic****HIST\*6000 Historiography I F [0.50]**

This course will introduce students to some of the essential components of the historical process as exemplified by the literature produced prior to 1914. It will also assess history as a cognitive discipline in contemporary society. While the scope of the course will extend from ancient times to the eve of World War I, emphasis will be placed on 19th-century historiography.

*Department(s):* Department of History

**HIST\*6020 Historiography II W [0.50]**

An examination of major examples of recent historical methodology, including works in cultural and social history. The student is also expected to develop and present a thesis proposal.

*Department(s):* Department of History

**HIST\*6040 Special Reading Course U [0.50]**

Students selecting this course should speak to individual instructors to arrive at appropriate topics.

*Department(s):* Department of History

**HIST\*6360 History of Sexuality and Gender U [0.50]**

This course will examine the history of gender and/or sexuality in different cultures, paying close attention to various theoretical approaches to understanding the history of gender and/or sexuality. The chronological and geographic focus of the course may vary according to the interests and expertise of the instructor.

*Department(s):* Department of History

**HIST\*6361 Sexuality History Research U [0.50]**

Continuation of HIST\*6360 in which students prepare an in-depth research paper based on primary sources.

*Department(s):* Department of History

**HIST\*6370 Topics in Cultural History U [0.50]**

History 6370 investigates the practices of cultural history and the utility of the cultural history paradigm in the investigation of topics including politics and power, religion, war, empire, gender, class, 'race', ethnicity, the environment, and consumption.

*Department(s):* Department of History

**HIST\*6371 Cultural History Research U [0.50]**

Continuation of HIST\*6370 in which students prepare an in-depth research paper based on primary sources.

*Department(s):* Department of History

**HIST\*6400 Major Paper U [1.00]**

This is to be a major piece of research, based on the extensive use of primary sources. An oral examination of this work is required.

*Department(s):* Department of History

**HIST\*6450 Quantitative Evidence and Historical Methods U [0.50]**

An overview of the use for historical research of quantitative evidence and methodologies.

*Department(s):* Department of History

**HIST\*6550 Rural History U [0.50]**

The countryside was not the city in overalls; it had its own complex trajectory intersecting with the rest of society in interesting and surprising ways. This seminar course introduces students to the economic, social, and cultural themes of rural history. Readings come from a variety of disciplines and explore the environment, agriculture, other resource-based activities, gender, cultural traditions, material artifacts and consumption. These themes will be related to community, identity and the countryside's relationship to the larger society.

*Department(s):* Department of History

**HIST\*6560 Rural History Research U [0.50]**

Continuation of HIST\*6550 in which students prepare an in-depth research paper based on primary sources.

*Prerequisite(s):* HIST\*6550

*Restriction(s):* Instructor consent required.

*Department(s):* Department of History

**HIST\*6570 Health, Science, Medicine U [0.50]**

This course will examine the history of health, science, and medicine. Topics may include the histories of mental illness, epidemic diseases, disability, public health, or alternative medicine. It will address expert and popular constructions of health, illness and science.

*Department(s):* Department of History

**HIST\*6580 Health, Science, Medicine Research U [0.50]**

Continuation of HIST\*6570 in which students prepare an in-depth research paper based on primary sources.

*Prerequisite(s):* HIST\*6570

*Restriction(s):* Instructor consent required.

*Department(s):* Department of History

**HIST\*6590 Public History, Heritage, and Historical Consciousness U [0.50]**

This seminar course will examine how history is displayed in public and the formation of historical consciousness. Areas of public history to be discussed may include digital history, museum exhibits, television and film productions, historical re-enactments, commemorations, celebrations, public holidays, monuments and historic sites.

*Department(s):* Department of History

**HIST\*6600 Public History Research U [0.50]**

Continuation of HIST\*6590 in which students prepare an in-depth research paper based on primary sources.

*Prerequisite(s):* HIST\*6590

*Restriction(s):* Instructor consent required.

*Department(s):* Department of History

**HIST\*6610 Histories of Tourism and Travel U [0.50]**

This seminar course will explore the history of modern tourism, examining the distinctions between travel and tourism in historical discourses and historiography, and engaging extensively with primary source material to examine the sector's evolution in trans-national perspective. Emphasis is placed on the development of key institutions, the influence of political environments, intercultural encounters, environmental impacts and global citizenship.

*Department(s):* Department of History

**HIST\*6620 Tourism, and Travel Histories Research U [0.50]**

Continuation of HIST\*6610 in which students prepare an in-depth research paper based on primary sources.

*Department(s):* Department of History

**Courses - PhD****HIST\*7000 Professional Development Seminar U [0.00]**

All doctoral students attend the professional development seminar in their first year of the program. The seminar is designed to prepare students for success as a PhD student for their future careers.

*Department(s):* Department of History

**HIST\*7010 Qualifying Examination U [0.50]**

This oral examination is designed to assess 1) the student's knowledge of the subject matter and ability to integrate the material read and 2) the student's ability and promise in research.

*Department(s):* Department of History

**HIST\*7030 Language Requirement U [0.00]**

A written demonstration of the student's knowledge of written French (or other appropriate second language).

*Department(s):* Department of History

**HIST\*7040 Major Field U [0.50]**

The examination written following completion of the major field seminar and before the oral qualifying examination.

*Department(s):* Department of History

**HIST\*7070 Thesis Proposal U [0.00]**

A written (up to 2,000 words, including citations) and oral demonstration of the proposed dissertation. The proposal will include a statement of the overall thesis of the dissertation, a description/discussion of the major research question(s), a review of the principal primary/archival sources being used, a chapter or topic outline, and a clear explanation of the originality of the thesis. Graded SAT/UNS.

*Restriction(s):* For PhD students only.

*Department(s):* Department of History

**HIST\*7080 Colloquium U [0.00]**

The colloquium is a public presentation of original research, normally a chapter, significant portion, or summary of the student's thesis. Graded SAT/UNS.

*Restriction(s):* For PhD students only.

*Department(s):* Department of History

The following courses are designed to study the central issues, ideas and historiography of the designated major field, within certain geographical and temporal limits. All seminar courses extend over two semesters. Students must register for the courses in each semester.

**HIST\*7100 Canadian History Major Seminar U [1.00]**

*Department(s):* Department of History

**HIST\*7120 Scottish History Major Seminar U [1.00]**

*Department(s):* Department of History

**HIST\*7140 Early Modern European History Major Seminar U [1.00]**

*Department(s):* Department of History

**HIST\*7150 Modern European History Major Seminar U [1.00]**

*Department(s):* Department of History

**HIST\*7170 Race, Slavery, and Imperialism Major Seminar U [1.00]**

*Department(s):* Department of History

**HIST\*7190 War and Society Major Seminar U [1.00]**

*Department(s):* Department of History

**HIST\*7250 Cold War Era History Major Seminar U [1.00]**

*Department(s):* Department of History

**HIST\*7260 Medieval History Major Seminar U [1.00]**

*Department(s):* Department of History

**HIST\*7270 World History Major Seminar U [1.00]**

*Department(s):* Department of History

**HIST\*7590 War and Society Minor Seminar U [1.00]**

*Department(s):* Department of History

**HIST\*7600 Canadian History Minor Seminar U [1.00]**

*Department(s):* Department of History

**HIST\*7610 British History Minor Seminar U [1.00]**

*Department(s):* Department of History

**HIST\*7620 Scottish History Minor Seminar U [1.00]**

*Department(s):* Department of History

**HIST\*7630 Community Studies Minor Seminar U [1.00]**

*Department(s):* Department of History

**HIST\*7640 Early Modern European History Minor Seminar U [1.00]**

*Department(s):* Department of History

**HIST\*7650 Modern European History Minor Seminar U [1.00]**

*Department(s):* Department of History

**HIST\*7660 Gender, Women and Family Minor Seminar U [1.00]**

*Department(s):* Department of History

**HIST\*7670 Race, Slavery, and Imperialism Minor Seminar U [1.00]**

*Department(s):* Department of History

**HIST\*7680 United States History Minor Seminar U [1.00]**

*Department(s):* Department of History

**HIST\*7690 International History Minor Seminar U [1.00]**

*Department(s):* Department of History

**HIST\*7700 Science, Medicine and Technology Minor Seminar U [1.00]**

*Department(s):* Department of History

**HIST\*7710 Other Minor Seminar U [1.00]**

*Department(s):* Department of History

**HIST\*7750 Cold War Era History Minor Seminar U [1.00]**

*Department(s):* Department of History

**HIST\*7760 Medieval History Minor Seminar U [1.00]**

*Department(s):* Department of History

**HIST\*7770 World History Minor Seminar U [1.00]**

*Department(s):* Department of History

**HIST\*7990 Doctoral Thesis U [0.00]**

Students are required to write and successfully defend a thesis of such cogency and originality as will represent a significant contribution to knowledge. The thesis will normally be between 50,000 and 90,000 words in length. University of Guelph regulations and procedures govern this process.

*Department(s):* Department of History

The requirements for an MA student taking a 7000-level course are substantially different from those for a PhD student. Therefore a PhD student who has previously taken any of these 7000-level courses may, with the permission of the department, repeat any of those 7000-level for credit in the Tri-University Doctoral Program.

## Human Health and Nutritional Sciences

The Human Health and Nutritional Sciences Graduate Program offers MSc degrees by thesis, MSc degrees by course work and project, and PhD degrees. The three fields are listed below.

- **Biomechanics**
- **Nutrition, Exercise and Metabolism**
- **Nutritional and Nutraceutical Sciences**

See the [department website](#) for additional information.

### Administrative Staff

#### Chair

Lawrence L. Spriet (354 Animal Science/Nutrition Bldg., Ext. 53745)

lspriet@uoguelph.ca

#### Associate Chair

Coral L. Murrant (350 Animal Science/Nutrition Bldg., Ext. 56173)

cmurrant@uoguelph.ca

#### Graduate Program Coordinator

David C. Wright (334 Animal Science/Nutrition Bldg., Ext. 56751)

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#### Assistant Graduate Program Coordinator for MSc by Coursework and Project Program

Alison M. Duncan (347 Animal Science/Nutrition Bldg., Ext. 53416)

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#### Graduate Program Assistant

Andra Williams (352 Animal Science/Nutrition Bldg., Ext. 56356)

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#### CBS Graduate Admissions Secretary

Karen White (3479 Science Complex, Ext. 52730)

cbsgrad@uoguelph.ca

### Graduate Faculty

#### Marica Bakovic

BSc, MSc Belgrade, PhD Alberta - Professor

#### Leah R. Bent

BSc, MSc Guelph, PhD British Columbia - Associate Professor

#### William J. Bettger

BS, PhD Missouri - Associate Professor

#### Stephen Brown

BHK, MHK Windsor, PhD Waterloo - Associate Professor

#### Jamie Burr

BA Western, MSc, PhD York - Assistant Professor

#### Andrea Clark

BSc Loughborough, PhD Calgary - Assistant Professor, Human Health and Nutritional Sciences, University of Guelph

#### Alison M. Duncan

BASc Guelph, MSc Toronto, PhD Minnesota - Professor

#### David J. Dyck

BSc, MSc, PhD Guelph - Professor

#### Graham P. Holloway

BA McMaster, MSc Waterloo, PhD Guelph - Associate Professor

#### Lorraine C. Jadeski

BSc Guelph, MSc Waterloo, PhD Western - Associate Professor

#### James B. Kirkland

BSc, PhD Guelph - Associate Professor

#### David W.L. Ma

BSc, PhD Alberta - Associate Professor

#### Kelly A. Meckling

BSc Calgary, PhD Toronto - Professor

#### Philip J. Millar

BSc, MSc, PhD McMaster - Assistant Professor

#### Coral L. Murrant

BSc, PhD Guelph - Associate Professor

#### David M. Mutch

BSc Queen's, PhD Lausanne - Associate Professor

#### Genevieve Newton

Doctor of Chiropractic Nat'l U of Health Sciences (Chicago), MSc, PhD Guelph - Assistant Professor

#### Geoffrey Power

BKin, MSc Memorial, PhD Western - Assistant Professor

#### Kerry Ritchie

BSc, PhD Guelph - Assistant Professor

#### Lindsay E. Robinson

December 11, 2017

BSc Acadia, PhD Alberta - Associate Professor

#### Jeremy Simpson

BSc, Guelph, PhD Queen's - Associate Professor

#### Lawrence L. Spriet

BSc Waterloo, MSc York, PhD McMaster - Professor and Chair

#### John Z. Srbely

BSc Toronto, DC Canadian Memorial Chiropractic College, PhD Guelph - Assistant Professor

#### Lori A. Vallis

BSc, MA Ottawa, PhD Waterloo - Associate Professor

#### Amanda Wright

BSc, PhD Guelph - Associate Professor

#### David Wright

BPE Calgary, MSc Arizona State, PhD Ball State - Associate Professor

#### John L. Zettel

BS Waterloo, MSc, PhD Toronto - Assistant Professor

### Associated Graduate Faculty

#### Bruce Holub

BSc Guelph, MSc, PhD Toronto - University Professor Emeritus, Human Health and Nutritional Sciences, University of Guelph

#### Krista Power

BSc Memorial, MSc, PhD Toronto - Research Scientist, Guelph Food Research Centre, Agriculture and Agri-Food Canada

#### Dan Ramdath

BSc Toronto, MSc, PhD West Indies - Manager/Clinical Research Scientist (Human Nutrition), Guelph Food Research Centre, Agriculture and Agri-Food Canada

### MSc Program

The MSc program is offered in: 1) biomechanics; 2) nutrition, exercise and metabolism; and 3) nutritional and nutraceutical sciences. The focus is on physical activity and diet as powerful lifestyle determinants of human health. The interaction between genetics and environmental factors determines human health and lifestyle is a major component of our environment.

Our graduate programs offer advanced experiential learning experiences in the broad areas of nutritional and nutraceutical sciences, general and exercise physiology and biomechanics within the focus of lifestyle, genetics and human health. Within these broad fields, the Department of Human Health and Nutritional Sciences addresses the issues at the level of the individual, not community or populations. The research efforts are focused on understanding the basic underlying biological aspects of health, which are further applied to understanding aging, neurological/sensory disorders and osteoarthritis, and chronic diseases such as cancer, cardiovascular disease, obesity, and type II diabetes

The Department offers programs of study leading to an MSc by thesis and an MSc by coursework and project. Within the MSc thesis program students must complete a minimum of 1.5 graduate credits and defend an acceptable thesis which comprises an account of the student's research. Within the MSc coursework program students must complete a minimum of 4.0 graduate credits which include credits for research experience.

### Admission Requirements

To be considered, applicants must meet the requirements of a four-year honours science degree with a minimum 75% average during the final two years or 4 semesters of undergraduate study. Applicants should have completed a course in statistics. Each applicant must obtain the support of a faculty member willing to serve as his/her advisor.

Admission may be granted in September, January or May. Completed applications should be uploaded at least one full semester (four months) before the expected date of admission. Applications from international students should be uploaded at least eight months prior to the expected date of admission.

All components of the application, including transcript(s), graduate certificate(s), grading scale(s), language test results, assessment forms, a statement of interest and the name of the faculty advisor must be uploaded no later than two months after an application is submitted through the OUAC portal. Applications that are incomplete after this time period will be closed.

### Admission Process

Graduate student applications to programs in the College of Biological Science are handled by the Office of the Associate Dean, Research (ADR). Before submitting an application, applicants are strongly encouraged to view the "[Before you Apply](#)" and "[Admission Process](#)" webpages on the ADR Future Student's site.

Complete application submission instructions may also be found on the [Office of Graduate Studies](#) webpage or in the [Graduate Calendar](#).

### Degree Requirements

Students enrol in one of two study options: 1) thesis, or 2) course work and major research project.

## Thesis

Students must complete and defend an acceptable thesis which comprises a scientifically defensible account of the student's research on a particular, well-defined research problem or hypothesis. Such research should begin with the practical expectation that it could be completed and the thesis defended in not more than 5 semesters. Paramount to the notion of acceptability of the thesis is its quality with respect to problem identification, the approach used to address the problem, and the evaluation of the results.

In addition they must successfully complete courses totalling not fewer than 1.5 graduate credits. The graduate credits of course work will consist of:

a) at least one of:

HHNS*6040	[0.50]	Research Fronts in Nutritional and Nutraceutical Sciences
HHNS*6500	[0.50]	Cardiovascular and Respiratory Physiology
HHNS*6700	[0.50]	Nutrition, Exercise and Metabolism
HHNS*6800	[0.50]	Research Frontiers in Integrative Biomechanics and Neurophysiology

b) at least 1.0 credits of electives as determined with the Advisory Committee

## Course Work and Major Research Project (MRP)

Students must complete at least 4.0 graduate credits as follows:

HHNS*6010	[0.50]	Seminar in Human Health and Nutritional Sciences
HHNS*6320	[0.50]	Advances in Human Health and Nutritional Sciences Research

at least one of:

HHNS*6910	[0.50]	Basic Research Techniques and Processes
HHNS*6920	[0.50]	Applied Research Techniques and Processes
HHNS*6930	[0.50]	Research Project

at least one of:

HHNS*6040	[0.50]	Research Fronts in Nutritional and Nutraceutical Sciences
HHNS*6500	[0.50]	Cardiovascular and Respiratory Physiology
HHNS*6700	[0.50]	Nutrition, Exercise and Metabolism
HHNS*6800	[0.50]	Research Frontiers in Integrative Biomechanics and Neurophysiology

at least 1.0 to 2.0 graduate credits of electives.

## PhD Program

The PhD program is offered in: 1) biomechanics; 2) nutrition, exercise and metabolism; and 3) nutritional and nutraceutical sciences. The focus is on physical activity and diet as powerful lifestyle determinants of human health. The interaction between genetics and environmental factors determines human health and lifestyle is a major component of our environment.

Our graduate programs offer advanced experiential learning experiences in the broad areas of nutritional and nutraceutical sciences, general and exercise physiology and biomechanics within the focus of lifestyle, genetics and human health. Within these broad fields, the Department of Human Health and Nutritional Sciences addresses the issues at the level of the individual, not community or populations. The research efforts are focused on understanding the basic underlying biological aspects of health, which are further applied to understanding aging, neurological/sensory disorders and osteoarthritis, and chronic diseases such as cancer, cardiovascular disease, obesity, and type II diabetes.

## Admission Requirements

Applicants must have a recognized Master's degree in a related field obtained with a minimum academic standing of 80% in their postgraduate studies, and the endorsement of a potential thesis advisor. Applicants should have completed a course in statistics. Under exceptional circumstances admission directly to a PhD program with an appropriate honours degree alone, or transfer from MSc to PhD program without completing the MSc thesis requirements, is also possible.

Admission may be granted in September, January or May. Completed applications should be uploaded at least one full semester (four months) before the expected date of admission. Applications from international students should be uploaded at least eight months prior to the expected date of admission.

Each applicant must obtain the support of a faculty member willing to serve as his/her advisor.

All components of the application, including transcript(s), graduate certificate(s), grading scale(s), language test results, assessment forms, a statement of interest and the name of the faculty advisor must be uploaded no later than two months after an application is submitted through the OUAC portal. Applications that are incomplete after this time period will be closed.

## Admission Process

Graduate student applications to programs in the College of Biological Science are handled by the Office of the Associate Dean, Research (ADR). Before submitting an application, applicants are strongly encouraged to view the "[Before you Apply](#)" and "[Admission Process](#)" webpages on the ADR Future Student's site.

Complete application instructions may also be found on the [Office of Graduate Studies](#) webpage or in the [Graduate Calendar](#).

## Degree Requirements

The major part of a student's time will be devoted to research in fulfilment of the dissertation requirement. Course work would be established through discussion with the student's Advisory Committee.

PhD students will become candidates for the PhD degree upon completion of a qualifying examination, which must be conducted not later than the fifth semester of the PhD program. The examination will be primarily research focused.

## Thesis Requirements

Submission and defence of an acceptable dissertation complete the requirements for a PhD. An acceptable dissertation comprises a report of the candidate's research on a particular and well-defined research problem or hypothesis. It should represent a significant contribution to knowledge in that field. Emphasis is placed on the quality of the work judged by the expression of mature scholarship and critical judgment in the dissertation. Dissertation approval implies that it could be published in reputable, refereed journals in its field.

## Interdepartmental Programs

Students may wish to participate in the interdepartmental programs in Bioinformatics or Biophysics

## Collaborative Specializations

Students may wish to participate in the collaborative specializations in Neuroscience or Toxicology

## Courses

<b>HHNS*6000 Students Promoting Awareness of Research Knowledge S,F,W [0.25]</b>	
This course will explore research communication through practical experience. The course will be part of the SPARK program in which students write, edit and coordinate a variety of news publications that highlight University of Guelph research activities for a wide range of audiences.	
<i>Restriction(s):</i>	Limited to HHNS MSc course work and project students only. Instructor consent required.
<i>Department(s):</i>	Department of Human Health and Nutritional Sciences
<b>HHNS*6010 Seminar in Human Health and Nutritional Sciences S [0.50]</b>	
Students will develop their scientific communication skills by translating a specific body of knowledge on a chosen topic into a seminar. The class will also explore scientific process-oriented concepts and issues such as effective scientific communication and dissemination of results.	
<i>Restriction(s):</i>	Limited to HHNS MSc course work and project students only.
<i>Department(s):</i>	Department of Human Health and Nutritional Sciences
<b>HHNS*6040 Research Fronts in Nutritional and Nutraceutical Sciences F [0.50]</b>	
Building on an information base in nutrition, biochemistry and physiology, the course comprises selected research topics pertaining to the importance of nutrition as a determinant of health throughout the life span. Distinction will be drawn between the metabolic basis of nutrient essentiality and the health protectant effects of nutraceuticals.	
<i>Department(s):</i>	Department of Human Health and Nutritional Sciences
<b>HHNS*6130 Advanced Skeletal Muscle Metabolism in Humans W [0.50]</b>	
This course examines how the energy provision pathways in human skeletal muscle and associated organs meet the energy demands of the muscle cell during a variety of metabolically demanding situations.	
<i>Department(s):</i>	Department of Human Health and Nutritional Sciences
<b>HHNS*6320 Advances in Human Health and Nutritional Sciences Research S,F,W [0.50]</b>	
This course provides the student with an opportunity to study a topic of choice and involves literature research on a chosen topic. The course may stand alone (MSc thesis and PhD students) or provide the background information for an experimental approach to the topic (MSc course work and project students).	
<i>Restriction(s):</i>	Instructor consent required.
<i>Department(s):</i>	Department of Human Health and Nutritional Sciences
<b>HHNS*6400 Functional Foods and Nutraceuticals F [0.50]</b>	
This course considers the relation of nutraceuticals, functional foods, designer foods, medical foods and food additives to foods and drugs. The course emphasizes the development and commercialization of nutraceuticals.	
<i>Department(s):</i>	Department of Human Health and Nutritional Sciences
<b>HHNS*6410 Applied Functional Foods and Nutraceuticals W [1.00]</b>	
This course prepares students to develop an innovative product or service from conceptualization to market entry considering regulatory, product development, safety/efficacy and market readiness issues. The course applies and integrates the concepts defined in HHNS*6400	
<i>Department(s):</i>	Department of Human Health and Nutritional Sciences

**HHNS\*6440 Nutrition, Gene Expression and Cell Signalling W [0.50]**

This course emphasizes the role nutrients play as modulators of gene expression at the molecular level. The mechanisms by which nutrients modulate gene expression through specific cell signalling cascades are examined. (offered annually)

*Department(s):* Department of Human Health and Nutritional Sciences

**HHNS\*6500 Cardiovascular and Respiratory Physiology F [0.50]**

This course will use both review articles and the primary literature to build a broad base of understanding of the cardiovascular and respiratory systems as well as explore current research in specific areas in this knowledge paradigm. Further, this course will build research skills through by strengthening critical analysis skills and both oral and written communication skills through learning about the cardiovascular and respiratory system and how they integrate.

*Department(s):* Department of Human Health and Nutritional Sciences

**HHNS\*6700 Nutrition, Exercise and Metabolism F [0.50]**

A discussion of recent concepts in the relationships among nutrition, exercise and metabolism. Information from the molecular to the whole-body level will be presented with a focus on understanding nutrition and exercise in the human. Emphasis is placed on the development and testing of experimental hypotheses in these areas of research.

*Department(s):* Department of Human Health and Nutritional Sciences

**HHNS\*6710 Advanced Topics in Nutrition and Exercise F [0.50]**

Advanced topics will be presented to establish an in-depth understanding of current investigations in nutrition and exercise. Based on the integrated understanding of nutrition and exercise developed in HHNS\*6700, the focus of this course will be to develop the student's ability to independently analyze original research investigations.

*Department(s):* Department of Human Health and Nutritional Sciences

**HHNS\*6800 Research Frontiers in Integrative Biomechanics and Neurophysiology F [0.50]**

This course will provide students with a breadth of knowledge and understanding across the research frontiers pursued by the integrative biomechanics and neurophysiology group. Students will be given opportunity to practice and improve oral and written communication skills and provide constructive feedback to their peers. Additionally, this class will engage students in dialogue around topics pertinent to designing and conducting successful experiments such as hypothesis generation and ethical and practical considerations.

*Department(s):* Department of Human Health and Nutritional Sciences

**HHNS\*6810 Research Methods in Integrative Biomechanics and Neurophysiology I F [0.50]**

This course develops a comprehensive understanding of methods and analysis related to research in biomechanics & neuroscience. Critical evaluation and application of basic signal to noise processing and electromyography is a priority. The course uses labs, assignments, and critical review of primary literature articles to develop a strong research foundation. Scientific writing and oral communication skills are emphasized via written reports and presentations, and numeracy throughout the course in data and lab assignments.

*Department(s):* Department of Human Health and Nutritional Sciences

**HHNS\*6820 Research Methods in Integrative Biomechanics and Neurophysiology II W [0.50]**

This course develops a comprehensive understanding of methods and analysis related to research in biomechanics & neuroscience. Critical evaluation and application of 3D kinematics and programming/modelling is a priority. The course uses labs, assignments, and critical review of primary literature articles to develop a strong research foundation. Scientific writing and oral communication skills are emphasized via written reports and presentations, and numeracy throughout the course in data and lab assignments.

*Prerequisite(s):* HHNS\*6810

*Department(s):* Department of Human Health and Nutritional Sciences

**HHNS\*6910 Basic Research Techniques and Processes S,F,W [0.50]**

Working with a faculty advisor, students will gain experience in basic aspects of scientific research. This will be accomplished through experience of one or more components of the scientific method in a laboratory setting. Objective outcomes will be evaluated and will include documentation of the experience in a written report.

*Restriction(s):* Restricted to HHNS MSc. course work and project students. Instructor consent required.

*Department(s):* Department of Human Health and Nutritional Sciences

**HHNS\*6920 Applied Research Techniques and Processes S,F,W [0.50]**

Under the supervision of a faculty advisor, students will gain practical experience in discipline-specific aspects of research. This will be accomplished through experience in a pre-arranged practicum in an applied setting. Objective outcomes will be evaluated and will include documentation of the experience in a written report.

*Restriction(s):* Restricted to HHNS MSc. course work and project students. Instructor consent required.

*Department(s):* Department of Human Health and Nutritional Sciences

**HHNS\*6930 Research Project S,F,W [0.50]**

Under the supervision of a faculty advisor and building on knowledge gained from Basic or Applied Research Techniques and Processes, students will carry out a specific research project to its completion. Results will be documented in a written report and communicated through a scientific poster.

*Prerequisite(s):* HHNS\*6910 or HHNS\*6920

*Restriction(s):* Restricted to HHNS MSc. course work and project students. Instructor consent required.

*Department(s):* Department of Human Health and Nutritional Sciences

## Integrative Biology

The Department of Integrative Biology is comprised of faculty members in three overlapping fields and offers MSc and PhD degrees in:

- **Ecology**
- **Evolutionary Biology**
- **Comparative Physiology**

Research is focused on a wide variety of organisms (from microbes to plants to animals) at multiple levels of organization (from molecules and cells through to entire ecosystems). Basic research is being used as a foundation to address some of the most important regional and global issues.

See the [department website](#) for additional information.

### Administrative Staff

#### Chair

John Fryxell (2480 Science Complex, Ext. 53598)  
jfrxell@uoguelph.ca

#### Graduate Program Coordinator

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#### CBS Graduate Admissions Secretary

Karen White (3479 Science Complex, Ext. 52730)  
cbsgrad@uoguelph.ca

### Graduate Faculty

#### Josef D. Ackerman

BSc Toronto, MA SUNY, PhD Cornell - Professor

#### Sarah J. Adamowicz

BSc Dalhousie, MSc Guelph, PhD Imperial College - Associate Professor

#### James S. Ballantyne

BSc, MSc Guelph, PhD British Columbia - Professor

#### Nicholas J. Bernier

BSc McGill, Diploma in Aquaculture Malaspina College, MSc British Columbia, PhD Ottawa - Professor

#### Elizabeth G. Boulding

BSc British Columbia, MSc Alberta, PhD Washington - Professor

#### Christina M. Caruso

BA Oberlin College, PhD Illinois - Associate Professor

#### Karl A. Cottenie

MSc, MS, PhD K.U. Leuven - Associate Professor and Graduate Program Coordinator

#### Stephen S. Crawford

BSc Guelph, MSc Queen's, PhD Guelph - Associate Professor

#### Teresa J.D. Crease

BSc, MSc Windsor, PhD Washington - Professor and Associate Dean, Graduate Studies

#### Roy G. Danzmann

BSc, MSc Guelph, PhD Montana - Professor

#### Moiria M. Ferguson

BSc, MSc Guelph, PhD Montana - Professor

#### John M. Fryxell

BSc, PhD British Columbia - Professor and Chair of Integrative Biology

#### Jinzhong Fu

BSc Nankai, MSc Chinese Academy of Sciences, PhD Toronto - Associate Professor

#### Todd E. Gillis

BSc, MSc Guelph, PhD Simon Fraser - Associate Professor

#### Ryan Gregory

BSc McMaster, PhD Guelph - Associate Professor

#### Cortland K. Griswold

BSc Wisconsin, MSc Toronto, PhD British Columbia - Associate Professor

#### Mehrdad Hajibabaei

BSc Tehran Azad, PhD Ottawa - Assistant Professor

#### Robert Hanner

BSc Eastern Michigan, PhD Oregon - Associate Professor

#### Paul D.N. Hebert

BSc Queen's, PhD Cambridge, FRSC - Professor

#### Andreas Heyland

BSc, MSc Zurich, PhD Florida - Associate Professor

#### Brian C. Husband

BSc, MSc Alberta, PhD Toronto - Professor and Associate Dean Academic, College of Biological Science

#### Frederic Laberge

BSc, MSc Laval, PhD Manitoba - Assistant Professor

#### Andrew MacDougall

BA Dalhousie, MSc York, PhD British Columbia - Associate Professor

#### Hafiz Maherali

BSc McGill, MSc, PhD Illinois - Associate Professor

#### Andrew G. McAdam

BSc McGill, MSc Western, PhD Alberta - Associate Professor

#### Kevin S. McCann

BA Dartmouth, MSc, PhD Guelph - Professor

#### Robert L. McLaughlin

BSc Windsor, MSc Queen's, PhD McGill - Associate Professor

#### Amy Newman

BSc Queen's; PhD British Columbia - Assistant Professor

#### Jonathan A. Newman

BA, PhD State Univ. of New York - Professor and Dean, College of Biological Sciences

#### Steven G. Newmaster

BSc Guelph, PhD Alberta - Associate Professor

#### Ryan Norris

BES Waterloo, MSc York, PhD Queen's - Associate Professor

#### Beren W. Robinson

BSc, MSc Dalhousie, PhD Binghamton - Associate Professor

#### M. Alexander Smith

BSc Trent, MSc Trent, PhD McGill - Associate Professor

#### Merritt R. Turetsky

BSc Villanova, PhD Alberta - Associate Professor

#### Glen J. Van Der Kraak

BSc, MSc Manitoba, PhD British Columbia - Professor and Associate Dean of Research, College of Biological Science

#### Patricia A. Wright

BSc McMaster, PhD British Columbia - Professor

### Associated Graduate Faculty

#### Cathryn Abbott

BSc Queen's, PhD Australian National - Research Scientist, Department of Fisheries & Oceans

#### Daniel Duplisea

BSc MSc Dalhousie, PhD Stockholm - Research Scientist, Dept. Fisheries & Oceans

#### Brock Fenton

BSc Queen's, MSc PhD Toronto - Professor & Chair, Western University

#### Douglas S. Fudge

BA, MAT Cornell, MSc Guelph, PhD British Columbia - Associate Professor

#### Shoshannah Jacobs

BSc MSc New Brunswick, PhD Ottawa - Contractually Limited Faculty, Integrative Biology, University of Guelph

#### Yan Jiao

BSc MSc Ocean, PhD Memorial - Associate Professor, Virginia Polytechnic University

#### Deborah MacLachy

BSc Acadia, PhD Manitoba - VP Academic/Provost, Wilfrid Laurier University

#### Nicholas Mandrak

BSc MSc PhD Toronto - Research Scientist, Department of Fisheries & Oceans

#### Tom Nudds

BSc MSc Windsor; PhD Western Ontario - Professor Emeritus, Integrative Biology, University of Guelph

#### Astrid Schwalb

BSc Konstanz, MSc Potsdam, PhD Guelph - Assistant Professor, Texas State University

#### Vernon Thomas

BA Oxford, MSc PhD Guelph - Professor Emeritus, Integrative Biology, University of Guelph

#### Terry Wheeler

BSc Memorial; MSc PhD Guelph - Associate Professor, McGill University

### MSc Program

The Integrative Biology Graduate Program offers MSc degrees in each of three major fields of emphasis: 1) ecology; 2) evolutionary biology; and 3) comparative physiology. The three areas of interest focus on (but are not restricted to) experimental approaches in field and laboratory settings and a strong linkage between theoretical and applied investigations. The department encourages students to pursue interdisciplinary research and, where appropriate, utilize faculty expertise from across campus on their advisory committees.

## Admissions Requirements

To be considered, applicants must meet the requirements of a four-year honours science degree with a minimum 'B' (75%) average during the final two years (4 semesters) of undergraduate study. Each applicant must obtain the support of a faculty member willing to serve as his/her thesis advisor.

Admission may be granted in September, January or May. Completed applications should be uploaded at least one full semester (four months) before the expected date of admission. Applications from international students should be uploaded at least eight months prior to the expected date of admission.

All components of the application, including transcript(s), graduate certificate(s), grading scale(s), language test results, assessment forms, a statement of interest and the name of the faculty advisor must be uploaded no later than two months after an application is submitted through the OUAC portal. Applications that are incomplete after this time period will be closed.

## Admission Process

Graduate student applications to programs in the College of Biological Science are handled by the Office of the Associate Dean, Research (ADR). Before submitting an application, applicants are strongly encouraged to view the "[Before you Apply](#)" and "[Admission Process](#)" webpage on the ADR Future Student's site.

Complete application submission instructions may also be found on the [Office of Graduate Studies](#) webpage or in the Graduate Calendar.

## Degree Requirements

Students must complete and defend an acceptable thesis. In addition, they must successfully complete courses totaling not fewer than 1.5 credits. These credits must include the mandatory course IBIO\*6630, Scientific Communication (0.50 credit)

An acceptable MSc thesis comprises a scientifically defensible account of the student's research on a particular, well-defined research problem or hypothesis. Such research should begin with the practical expectation that it could be completed and the thesis defended in not more than six semesters. Paramount to the notion of acceptability of the thesis is its quality with respect to the underlying rationale (problem identification), the approach used to address the problem, and the evaluation of the results. Final acceptance of the MSc thesis need not imply that the work is sufficiently meritorious to warrant publication in scholarly media, though the majority of MSc research in the department is published.

The Department endorses the idea that graduate students in the Integrative Biology program should benefit from exposure to recent developments both within and between the major areas of emphasis. To that end, students may enrol in any of the regularly offered courses entitled "Advances in ...". A selection of subjects is given in each of the course descriptions below. Details of course content, format and evaluation will be available in the Office of the Chair of the Department one semester prior to the semester in which the course is offered.

In addition, the Department offers two "Topics in Advanced Integrative Biology" courses to provide students with the opportunity to study with individual faculty on specific topics in the faculty member's area of expertise. These courses may be taken by groups as either reading/seminar courses, or on an individual research-project basis. Students should approach individual faculty members to request supervision on individual research project courses. In addition, faculty members may be petitioned by students to offer, or may advertise, "Topics in Advanced Integrative Biology" courses at least one semester prior to the semester in which the course is to be offered.

The Department also offers Special Topics courses that combine a senior-level undergraduate course in ecology, evolutionary biology, or comparative physiology with an additional component – typically a major paper or research project. These courses are coordinated by a single faculty member who should be consulted for more information.

## PhD Program

The Integrative Biology Graduate Program offers PhD degrees for studies in each of the three major fields of emphasis: 1) ecology; 2) evolutionary biology; and 3) comparative physiology. The 3 three areas of emphasis focus on (but are not restricted to), experimental approaches in field and laboratory settings and a strong linkage between theoretical and applied investigations. The Department encourages students to pursue interdisciplinary research and, where appropriate, utilize faculty expertise from across campus on their advisory committees.

## Admissions Requirements

The admission and degree requirements of the PhD program are essentially those of the university. Most applicants will have a recognized Master's degree in a related field obtained with minimum academic standing of 'A-' (80%) in their postgraduate studies, and the endorsement of a potential thesis advisor. Under exceptional circumstances admission directly to a PhD program with an appropriate honours degree alone, or transfer from MSc to PhD program without completing the MSc thesis requirements, is also possible. Applications should be uploaded at least one full semester (four months) prior to the expected date of admission. Applications from international students should be uploaded at least eight months prior to the expected date of admission.

Each applicant must obtain the support of a faculty member willing to serve as his/her thesis advisor.

All components of the application, including transcript(s), graduate certificate(s), grading scale(s), language test results, assessment forms, a statement of interest and the name of the faculty advisor must be uploaded no later than two months after an application is submitted through the OUAC portal. Applications that are incomplete after this time period will be closed.

## Admissions Process

Graduate student applications to programs in the College of Biological Science are handled by the Office of the Associate Dean, Research (ADR). Before submitting an application, applicants are strongly encouraged to view the "[Before you Apply](#)" "[Admission Process](#)" webpage on the ADR Future Student's site.

Complete application instructions may also be found on the [Office of Graduate Studies](#) webpage or in the Graduate Calendar

## Degree Requirements

The Integrative Biology program expects that the major part of the student's time will be devoted to research in fulfillment of the thesis requirement. For that reason, the Department does not require that PhD students with an MSc degree take any courses. Students entering directly into the PhD program are required to take 1.0 course credits, which must include IBIO\*6630, Scientific Communication (0.50 credit) in their first or second semester. Furthermore, advisory committees may, from time to time, require that a student take some prescribed or additional courses. Regardless, PhD students are expected to contribute and participate actively in the full academic life of the department, including regular attendance at departmental and inter-departmental seminars, and to provide leadership and counseling to undergraduate and MSc students.

PhD students will become candidates for the PhD degree upon successful completion of a qualifying examination with oral and written components, which should be conducted not later than the third semester of the PhD program. The exam evaluates students' knowledge in the general area of the intended research.

Submission and defence of an acceptable thesis complete the requirements for a PhD. An acceptable thesis comprises a report of the candidate's research on a particular and well-defined research problem or hypothesis. It should represent a significant contribution to knowledge in that field. Emphasis is placed on the quality of the work as judged by the expression of mature scholarship, critical judgment, and satisfactory literary style in the thesis. Thesis approval implies that the research is judged sufficiently meritorious to warrant publication in reputable, refereed journals in its field.

## Interdepartmental Programs

Faculty in Integrative Biology also participate in the interdepartmental programs in Bioinformatics or Biophysics

## Collaborative Specializations

Faculty in Integrative Biology also participate in the collaborative specializations in Neuroscience or Toxicology

## Courses

### Ecology

#### IBIO\*6000 Special Topics in Ecology and Behaviour U [0.50]

This is a course in which several faculty lecture and/or lead discussion groups in tutorials about advances in their broad areas, or related areas, of ecology and behaviour. Topics may include animal communication, optimal foraging, life-history evolution, mating systems, population dynamics, niche theory and food-web dynamics, and will depend on who is co-ordinating the course for that particular offering. The course includes lectures and seminars in which the students actively participate.

*Department(s):* Department of Integrative Biology

### Evolutionary Biology

#### IBIO\*6020 Special Topics in Evolutionary Biology U [0.50]

This modular course reviews books and/or other publications in the field of evolutionary biology, providing knowledge of progress in this area of biology. Topics may include epigenetics, phylogenetics, developmental basis of evolutionary change, and molecular evolution. The course includes lectures and seminars in which the students participate. Offered annually.

*Department(s):* Department of Integrative Biology

### Comparative Physiology

#### IBIO\*6010 Special Topics in Physiology U [0.50]

This is a course in which several faculty lecture and/or lead discussion groups in tutorials about advances in their broad areas, or related areas, of physiology. Topics may include metabolic adaptation to extreme environments, behavioural and molecular endocrinology, and exercise and muscle physiology, and will depend on who is co-ordinating the course for that particular offering. The course includes lectures and seminars in which the students actively participate.

*Department(s):* Department of Integrative Biology

## General

### **IBIO\*6070 Advances in Integrative Biology I U [0.50]**

This course provides graduate students, either individually or in groups, with the opportunity to pursue topics in specialized fields of integrative biology under the guidance of graduate faculty. Courses may be offered in any of lecture, reading/seminar, or individual project formats. A minimum enrolment may be required for some course offerings.

*Restriction(s):* Instructor consent required.

*Department(s):* Department of Integrative Biology

### **IBIO\*6080 Advances in Integrative Biology II U [0.50]**

This course provides graduate students, either individually or in groups, with the opportunity to pursue topics in specialized fields of integrative biology under the guidance of graduate faculty. Courses may be offered in any of lecture, reading/seminar, or individual project formats. A minimum enrolment may be required for some course offerings.

*Restriction(s):* Instructor consent required.

*Department(s):* Department of Integrative Biology

### **IBIO\*6630 Scientific Communication U [0.50]**

This course involves development and refinement of the skills of scientific communication, with emphasis on writing skills, in the context of developing a thesis proposal. This course is mandatory for MSc AND DIRECT ENTRY PhD students in the Department of Integrative Biology.

*Department(s):* Department of Integrative Biology

## Landscape Architecture

The Landscape Architecture program offers courses of study leading to the Master of Landscape Architecture (MLA) degree. The MLA program is designed for students with a previous degree in a field unrelated to landscape architecture; for students who hold other professional degrees in architecture, planning and engineering; and for students who have received a BLA degree and are interested in advanced education in a particular area of landscape architecture. The MLA program emphasizes research, analysis, planning, design and management of landscapes ranging in scale from individual sites to entire communities and regions. The MLA program is accredited by the Canadian Society of Landscape Architects. This accreditation is also recognized by the American Society of Landscape Architects.

### Administrative Staff

#### Director, SEDRD

Sean Kelly (104 Landscape Architecture, Ext. 56870)  
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#### Graduate Program Assistant

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### Graduate Faculty

#### Nadia Amoroso

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#### Nicholas Brunet

BSc McGill, MSc Guelph, PhD McGill - Assistant Professor

#### Robert Corry

BLA Guelph, MLA Minnesota, PhD Michigan, CSLA, OALA - Associate Professor

#### John E. FitzGibbon

BA McMaster, MSc Wales, PhD McGill, MCIP, RPP - Professor

#### Larry B. Harder

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#### Martin Holland

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#### Sean Kelly

BLA Guelph, MSc (Planning) Guelph, CSLA, OALA, ASLA - Associate Professor

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### Associated Graduate Faculty

#### James R. Taylor

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#### Robert D. Brown

Professor, School of Landscape Architecture - BSc, Saskatchewan, MLA, Texas A&M University, PhD Guelph

### MLA Program

### Admission Requirements

Admission to the MLA program is not restricted to holders of the BLA degree. Strongly motivated graduates of honours programs in a variety of disciplines may be admissible under the normal Faculty of Graduate Studies admission requirements. Well prepared applicants will have studied as broadly as possible in their undergraduate programs.

Application deadline and additional information on the MLA program at the University of Guelph can be obtained from our internet address at: <http://www.uoguelph.ca/sedrd/>

### Degree Requirements

Students are encouraged to relate their major emphasis in the MLA to their undergraduate discipline through course work and thesis.

### Required Core

#### For the holder of a BLA with several subsequent years of significant professional experience:

LARC*6380	[0.25]	Research Seminar
LARC*6600	[0.50]	Critical Inquiry & Research Analysis
LARC*6610	[0.50]	Research Methods

LARC\*6710 [0.50] Special Study

1 Elective

Thesis

#### For the holder of a BLA without such professional experience

LARC*6380	[0.25]	Research Seminar
LARC*6470	[0.50]	Integrative Environmental Planning
LARC*6600	[0.50]	Critical Inquiry & Research Analysis
LARC*6610	[0.50]	Research Methods
LARC*6710	[0.50]	Special Study

2 Electives

Thesis

#### For holders of degrees other than the BLA:

LARC*2240	0.50	Plants in the Landscape
LARC*6010	[0.50]	Landscape Architecture Studio I
LARC*6020	[0.50]	Landscape Architecture Studio II
LARC*6030	[0.50]	Landscape Architecture Studio III
LARC*6040	[0.50]	Landscape Architecture Studio IV
LARC*6120	[0.50]	Community Design
LARC*6340	[0.25]	Landscape History Seminar
LARC*6360	[0.25]	Professional Practice Seminar
LARC*6380	[0.25]	Research Seminar
LARC*6430	[0.50]	Landscape Resource Analysis
LARC*6470	[0.50]	Integrative Environmental Planning
LARC*6440	[0.50]	Environmental Design
LARC*6600	[0.50]	Critical Inquiry & Research Analysis
LARC*6610	[0.50]	Research Methods
LARC*6710	[0.50]	Special Study

Thesis

### Courses

### Theory and Practice

#### LARC\*6010 Landscape Architecture Studio I F [0.50]

Studio and field instruction introduces the student to landscape architecture through acquisition of basic professional skills and knowledge. Topics include design theory, landscape inventory and analysis, application of the design process to projects at the site scale, graphic and oral communication.

*Restriction(s):* Available only to students registered in the MLA program.

*Department(s):* School of Environmental Design and Rural Development

#### LARC\*6020 Landscape Architecture Studio II F [0.50]

Studio and field instruction introduces the student to basic knowledge and skills of site engineering as it relates to landscape architecture. Topics include surveying, principles of site grading and drainage, introduction to materials and methods of construction, and graphic communication.

*Restriction(s):* Available only to students registered in the MLA program.

*Department(s):* School of Environmental Design and Rural Development

#### LARC\*6030 Landscape Architecture Studio III W [0.50]

Studio and field instruction continues the student's development of professional knowledge and skills at the site scale. Topics include site planning principles, social factors in design, introduction to principles of planting design and architectural structures, facilitation and computer applications in design.

*Restriction(s):* Available only to students registered in the MLA program.

*Department(s):* School of Environmental Design and Rural Development

#### LARC\*6040 Landscape Architecture Studio IV W [0.50]

Studio instruction emphasizes design implementation, materials and methods of construction, principles of stormwater management, construction specifications and graphic communication using computer applications.

*Restriction(s):* Available only to students registered in the MLA program.

*Department(s):* School of Environmental Design and Rural Development

#### LARC\*6120 Community Design W [0.50]

Studio and field instruction emphasizes integration of ecological, social, cultural and historical factors in the comprehensive design of urban and special use landscapes at the neighbourhood and community scale.

*Restriction(s):* Available only to students registered in the MLA program.

*Department(s):* School of Environmental Design and Rural Development

#### LARC\*6340 Landscape History Seminar F [0.25]

A lecture/seminar course focussed on the history of Landscape Architecture. Skills emphasize the development of oral and writing skills.

*Restriction(s):* Available only to students registered in the MLA program.

*Department(s):* School of Environmental Design and Rural Development

**LARC\*6360 Professional Practice Seminar F [0.25]**

A lecture/seminar course focussed on the legal, business, ethical and professional practices of Landscape Architecture professionals. Skills emphasize the development of oral and writing skills.

*Restriction(s):* Available only to students registered in the MLA program.

*Department(s):* School of Environmental Design and Rural Development

**Landscape Analysis and Planning****LARC\*6430 Landscape Resource Analysis F [0.50]**

Integrated field and classroom instruction introduces the student to inventory and analysis of biological, physical, social and cultural elements of the landscape. Projects will incorporate principles of landscape ecology and landscape planning. Field study will require some travel at student's expense.

*Restriction(s):* Available only to students registered in the MLA program.

*Department(s):* School of Environmental Design and Rural Development

**LARC\*6440 Environmental Design F [0.50]**

This course integrates field and classroom study to apply landscape ecology to current landscape problems, including analysis of regional landscapes, restoration of degraded landscapes, and application of aesthetic and ecological principles across scales in site to regional settings. Case studies component will require some travel at students' expense.

*Restriction(s):* Available only to students registered in the MLA program.

*Department(s):* School of Environmental Design and Rural Development

**LARC\*6470 Integrative Environmental Planning W [0.50]**

Landscape planning emphasizing the integration and interrelationships between biophysical and cultural resources, with application at a regional landscape planning scale. This course typically incorporates community-outreach projects.

*Restriction(s):* Available only to students registered in the MLA program.

*Department(s):* School of Environmental Design and Rural Development

**Research Techniques and Practice**

EDRD\*6000 [0.50] Qualitative Analysis in Rural Development

**LARC\*6380 Research Seminar W [0.25]**

A seminar course focussed on the process and communication of research, influenced by the current research of the participants. Participants organize a conference to present their research results.

*Restriction(s):* Available only to students registered in the MLA program.

*Department(s):* School of Environmental Design and Rural Development

**LARC\*6600 Critical Inquiry & Research Analysis W [0.50]**

Students are introduced to critical inquiry as a method of evaluating information, design, and planning. The focus of the course is on the quantification and analysis of research data. Modelling and simulation are introduced and discussed in the context of planning, design, and research.

*Restriction(s):* Available only to students registered in the MLA program.

*Department(s):* School of Environmental Design and Rural Development

**LARC\*6610 Research Methods F [0.50]**

An introduction to a broad array of research methods as they apply to landscape planning and design, with a focus on the connections between research and design. Emphasis is on developing foundations for the creation of appropriate research questions.

*Restriction(s):* Available only to students registered in the MLA program.

*Department(s):* School of Environmental Design and Rural Development

RPD\*6170 [0.50] Rural Research Methods

**Independent Study****LARC\*6710 Special Study S,F,W [0.50]**

Independent study. A proposal for the content and product required for this course must be developed in conjunction with the student's Advisory Committee.

*Restriction(s):* Instructor consent required.

*Department(s):* School of Environmental Design and Rural Development

## Latin American and Caribbean Studies

This is the only Latin American and Caribbean Studies Master's program in Canada to bridge the social sciences and the humanities. The program is particularly innovative with its participation in the collaborative specialization in International Development. In addition to being able to finish the program in three semesters, students also have the benefit of studying in a community with the largest concentration of Latin American scholars internationally renowned for their major collaborative and individual research projects. Study Abroad gives students an opportunity to study and/or participate in projects at partner institutions in Latin America and the Caribbean. LACS program does not train students for specific careers, but prepares them for a variety of jobs that require analytical skills, an international perspective, and the ability to communicate in both English and Spanish. The program prepares students for further study and research at the doctoral level, either in a related core discipline or in an interdisciplinary program.

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### Associated Graduate Faculty

#### Pascal Lupien

BA McGill, MA, PhD University of Guelph - Adjunct Professor, LACS and Political Science

## MA Program

### Admission Requirements

The normal requirement for admission to the LACS MA program is the equivalent of an Honours degree from a recognized institution with at least 78% or higher in the last two years of study. Preference will be given to students who have taken upper-level undergraduate courses in areas such as Latin American and Caribbean history, society, politics, development, literature, art, languages, and music. A reading knowledge of Spanish will be required. Students wishing to enter the program normally do so in September.

### Degree Requirements

LACS students will enroll in one of two study options, course work and major research paper or thesis. Study Abroad is not mandatory but strongly recommended to all students.

### Course Work and Major Research Paper

Students take 4 required courses (2.0 credits), 2 electives (1.0 credits) and write a major research paper (1.0 credit). This option is recommended because it gives students breadth in their study.

Required courses:

LACS*6000	[0.50]	Research Methods Seminar
LACS*6010	[0.50]	Latin American Identity & Culture
LACS*6020	[0.50]	Re-Imagining Community in Latin America
LACS*6030	[0.50]	Globalization & Insecurity in the Americas

In addition, students will also take two electives in the area of culture or society. Students who choose to go on an exchange in semester 2 of the program will not need to take LACS\*6020. They can replace the winter portion of the course with a comparable course taken at the host university. While abroad, students will have the opportunity to develop language proficiency, and to conduct research or take courses for their major project. The major paper LACS\*6100 Research Project (1.0 credits) consists of approximately 12,000 words and will be researched and written under the direction of one or two faculty members, one of whom could be from an exchange Latin American partner university.

### Thesis

Students take the following 4 required courses (2.0 credits) and write a thesis:

LACS*6000	[0.50]	Research Methods Seminar
LACS*6010	[0.50]	Latin American Identity & Culture
LACS*6020	[0.50]	Re-Imagining Community in Latin America
LACS*6030	[0.50]	Globalization & Insecurity in the Americas

Students who choose to write their major paper or thesis from a social science perspective may replace LACS\*6000 with SOC\*6140 (F) or SOC\*6140 (W) or SOC\*6130 (W).

### Collaborative Specializations

### International Development Studies

Latin American and Caribbean Studies graduate students have the opportunity to pursue the MA in Latin American and Caribbean Studies with the designation "International Development Studies." Students wishing to take MA in Latin American and Caribbean Studies (LACS) in conjunction with the International Development Studies (IDS) collaborative specialization must enter the LACS program and satisfy both the LACS admission requirements and the IDS admission requirements. Please consult the International Development Studies listing for a detailed description of the MA collaborative specialization including the special additional requirements for each of the participating departments or programs.

### Courses

<b>LACS*6000 Research Methods Seminar U [0.50]</b>
This course will introduce students to the field and research methods of various disciplines and of interdisciplinary studies, and it will familiarize them with field-relevant research skills and methodologies.
<i>Department(s):</i> School of Languages and Literatures
<b>LACS*6010 Latin American Identity &amp; Culture F [0.50]</b>
This is the first of the two required LACS culture core courses. They will address theoretical issues relevant to Latin American identities and cultures, and will use these as heuristic devices in the study of major and marginalized cultural events, narratives, and visual and musical expressions. In LACS*6010 students will analyze the concept of "hybridity" and study how hybrid culture has been incorporating past with the present, and how it is and has been incorporating local and African forms and themes with European and US derived high culture.
<i>Department(s):</i> School of Languages and Literatures
<b>LACS*6020 Re-Imagining Community in Latin America W [0.50]</b>
This graduate seminar examines recent developments in community theory, studying representative works of literature, film, and music that re-imagine the ideas and formations of Latino, Latin American and Caribbean communities. Students going an exchange may replace this course with a similar course taken at the exchange university.
<i>Department(s):</i> School of Languages and Literatures

**LACS\*6030 Globalization & Insecurity in the Americas F [0.50]**

An analytical, critical and interdisciplinary introductory overview of Latin America and the Caribbean in the larger context of the Americas, from the point of view of the security and insecurity of its people. It will concentrate on the interplay of environmental, economic, social, political, and cultural factors upon such security in an era of globalization.

*Department(s):* School of Languages and Literatures

**LACS\*6040 Novel & Nation in Spanish America W [0.50]**

This course will study the constitution of Spanish American nation in the novel since 1900 from a variety of theoretical perspectives. Particular attention will be paid to the novel's appropriation of foreign artistic and cultural influences to articulate Spanish American history. Offered in conjunction with SPAN\*4100 or SPAN\*4410. Extra work is required of graduate students.

*Restriction(s):* Credit may be obtained for only one of LACS\*6040 or SPAN\*4100/SPAN\*4410.

*Department(s):* School of Languages and Literatures

**LACS\*6070 Civil Society and Activism in Latin America U [0.50]**

This graduate seminar will provide an analytical, critical and interdisciplinary overview of relevant sociopolitical topics in contemporary Latin America, with a focus on the role of civil society and collective action in reshaping the social and political landscape of the region.

*Department(s):* School of Languages and Literatures

**LACS\*6100 Research Project U [1.00]**

This research project will result in a major paper of about 15,000 words. The student chooses a topic and writes a paper on the topic with the guidance of a faculty member. The topic must be approved by the Graduate Program Committee.

*Department(s):* School of Languages and Literatures

**LACS\*6200 Topics in Latin American and Caribbean Studies U [0.50]**

An independent study course, the nature and content of which is agreed upon between the individual student and the person offering the course.

*Restriction(s):* Instructor and Graduate Program Coordinator signatures required.

*Department(s):* School of Languages and Literatures

ECON*6350	[0.50]	Economic Development
ECON*6370	[0.50]	Economic Development in Historical Perspective
ENGL*6811	[0.50]	Special Topics in English
FREN*6022	[0.50]	Topics in Caribbean and African Literatures
HIST*6500	[0.50]	Topics in Global History
HIST*6520	[0.50]	Topics in Latin American History
HIST*6521	[0.50]	Latin American History Research
POLS*6050	[0.50]	Gender and Politics
POLS*6250	[0.50]	Comparative Governments in the Americas
SOC*6270	[0.50]	Diversity and Social Equality
SOC*6420	[0.50]	Global Agro-Food Systems, Communities and Rural Change
SOC*6460	[0.50]	Gender and Development

## Leadership

The MA (Leadership) focuses on the challenges facing leaders in the public, private and not-for-profit sectors, with an emphasis on the interaction between, and interdependency of, these spheres. Successful completion of the MA (Leadership) degree involves a comprehensive program of theoretical study backed by significant practical experience and analysis. Participants will also undertake a formal self-assessment process to gain insight into their own strengths and weaknesses and their ultimate leadership potential.

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#### Erna van Duren

BA Waterloo, MSc, PhD Guelph - Professor

#### John Walsh

BA Thames Polytechnic, MBA, PhD Western Ontario - Professor

#### Agnes Zdaniuk

December 11, 2017

BA, MASc, PhD Waterloo - Assistant Professor

## MA Leadership

The MA (Leadership) is designed to enable mid-career professionals to complete a graduate degree without interrupting their careers. Web-based distance courses are combined with brief sessions in Guelph and the completion of a major research project. Students may also complete the MA (Leadership) degree by taking two additional courses in place of the Major Research Project with a course-work option.

### Admission Requirements

Minimum admission requirements are:

A four year undergraduate degree or its equivalent (from a recognized university or college) with an average of at least a "B-" (70-72%) in the last two years of study AND having completed at least three years of relevant work experience

### OR

Alternate admission may be offered to applicants with a three year General degree, diploma and/or an acceptable professional designation AND having completed at least five years of relevant work experience.

Meeting the minimum criteria for admission does not guarantee acceptance into the program. Limitations of funds, space, facilities or personnel may make it necessary for the University, at its discretion, to refuse admission to an otherwise qualified applicant.

### Degree Requirements

On average participants allot 20 to 25 hours per week to study and participate in the program. This is an approximate number of hours and may vary depending on personal learning style. Participants normally complete the MA (Leadership) within 20-24 months. Normally, course modules are eight weeks in length and are completed in a pre-determined sequence, but some variations exist. Students may choose one of two options.

### Course Work and Major Research Project

Students must complete six web-based courses (3.0 credits), two residency courses (1.0 credit) plus the major research project (1.0 credit) or by taking two additional courses (1.0 credit). The project requires a literature review, data collection, and data analysis, which culminates in a major research project.

### Course Work

Students must complete six web-based courses (3.0 credits), two residency courses (1.0 credit) and two additional courses (1.0 credit).

### Courses

LEAD*6000 Foundations of Leadership U [0.50]
The course will enhance participants' interpersonal competency, as well as their knowledge and understanding of the theory and research underlying the impact of team management and collaboration on the organization.
<i>Restriction(s):</i> CBE Executive Programs students only
<i>Department(s):</i> Executive Programs
LEAD*6100 Theories of Leadership U [0.50]
This course traces the development of the concept of leadership. Through the interplay of theory and practical application, participants will gain a deeper appreciation for the requirements, responsibilities, and consequences of effective leadership.
<i>Restriction(s):</i> CBE Executive Programs students only
<i>Department(s):</i> Executive Programs
LEAD*6200 Leadership of Organizational Change U [0.50]
This course studies the role of leadership in the management of change within an organization and the changes required of management. The course examines the development of trust, the building of organizational loyalty, and motivation and inspiring of high performance teams.
<i>Restriction(s):</i> CBE Executive Programs students only
<i>Department(s):</i> Executive Programs
LEAD*6220 Strategic Leadership and Management U [0.50]
As a research intensive course in the MA Leadership, this course examines the conceptual and practical dimensions of strategic leadership and management in a variety of organizational, external and individual contexts using a selection of readings, discussions, case analyses and a final paper.
<i>Department(s):</i> Executive Programs
LEAD*6300 Role of the Leader in Decision-Making U [0.50]
The role of the leader in decision-making is explored through the study of the rational model for decision-making, human biases, creativity, and risk and uncertainty in decision-making. The course will also examine ethical issues and group decision-making.
<i>Restriction(s):</i> CBE Executive Programs students only
<i>Department(s):</i> Executive Programs

**LEAD\*6350 The Role of the Leader as Reflective Practitioner U [0.50]**

This course will enhance the leader's ability to navigate the complexity of organizational life and contribute to building a more sustainable society by developing skills in reflective practice. Reflective practice is divided into four areas that stretch over eight modules: Rethinking, Relating, Responding and Reinventing.

*Restriction(s):* CBE Executive Programs students only

*Department(s):* Executive Programs

**LEAD\*6400 Research Methods for Decision-Making U [0.50]**

The course will explore both quantitative and qualitative techniques used in the analysis of research results from a variety of sources (surveys, government statistics, in-depth interview, focus groups and program evaluation results). Case studies will be used to demonstrate the application of multiple research methods.

*Restriction(s):* CBE Executive Programs students only

*Department(s):* Executive Programs

**LEAD\*6500 Ethics in Leadership U [0.50]**

Issues in the use and application of ethical standards by leaders are explored through examples from history, current events, novels, films and television. Relevant theory is applied to leadership examples to help students develop an ethical framework for the exercise of leadership skills.

*Restriction(s):* CBE Executive Programs students only

*Department(s):* Executive Programs

**LEAD\*6600 Foundations of Leadership for Retirement and Senior Living U [0.50]**

Leadership in the senior living sector requires unique skills, competencies and practice. The purpose of this course is to explore leadership theories and concepts in this context. Understanding the rights and choices of seniors, the future of the aging population, care and support services available and legislative requirements is essential to individuals interested in pursuing career growth in senior living.

*Restriction(s):* CBE Executive Programs students only

*Department(s):* Executive Leadership Program

**LEAD\*6720 Politics of Organizations U [0.50]**

This course reviews a variety of theories and models that help to explain the behavioural underpinnings that influence and shape management and leadership processes within organizations. Examples from history and current events are explored to illustrate theory.

*Restriction(s):* CBE Executive Programs students only

*Department(s):* Executive Programs

**LEAD\*6740 Coaching and Developing Others U [0.50]**

This course will provide student with an opportunity to design developmental plans for direct reports, assess their coaching skills, and develop their coaching skills to support the development of others.

*Restriction(s):* CBE Executive Programs students only

*Department(s):* Executive Programs

**LEAD\*6800 Personal Skill Self-Assessment U [0.50]**

Using the "Basis of Competence" model, this course examines personal skills in four areas: Managing Self, Communicating, Managing People and Tasks, and Mobilizing Innovation and Change. The skills required to make smooth transitions from one job to another in a dynamic workplace will be explored.

*Restriction(s):* CBE Executive Programs students only

*Department(s):* Executive Programs

**LEAD\*6900 Major Research Project U [1.00]**

This course involves a directed research project leading to a referenced, professional report on a leadership problem or issue.

*Restriction(s):* CBE Executive Programs students only

*Department(s):* Executive Programs

BUS\*6400

## Literary Studies/Theatre Studies in English

The PhD Program in Literary Studies/Theatre Studies in English at the University of Guelph presents an opportunity for doctoral study that is unique in Canada. Although students might choose to focus on either literary studies or theatre studies, the special opportunity provided by the PhD Program is its contribution to the evolution of interdisciplinary work in the humanities. This bridging of disciplines allows for opportunities not available in more traditional doctoral programs, especially in inter-discursive and theoretical work across the boundaries of literary and theatre studies. Students can choose to undertake research in one or more of six fields of specialization:

- Studies in Canadian Literatures
- Colonial, Postcolonial and Diasporic Studies
- Early Modern Studies
- Studies in the History and Politics of Performance and Theatre
- Sexuality and Gender Studies
- Transnational Nineteenth-Century Studies

### Administrative Staff

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BSc, MA Western, PhD York - Professor

#### Stephen D. Powell

BA Oberlin College, MA Indiana (Bloomington), PhD Toronto - Associate Professor

#### Pablo Ramirez

BA Yale; MFA Miami; MA, PhD Michigan - Associate Professor

#### Paul W. Salmon

BA Western, MA Toronto, PhD Western - Assistant Professor

#### Jennifer Schacker

BA McGill, MA, PhD Indiana - Associate Professor

#### Sandra Singer

BA Trent, MA Queen's, PhD Cambridge - Associate Professor

#### J.R. (Tim) Struthers

BA, MA, PhD Western Ontario - Associate Professor

#### Ann Wilson

BA, MA, PhD York - Associate Professor and Director

### PhD Program

The PhD Program in Literary Studies/Theatre Studies in English is offered in six fields of specialization: 1) studies in Canadian literatures; 2) colonial, postcolonial and diasporic studies; 3) early modern studies; 4) studies in the history and politics of performance and theatre; 5) sexuality and gender studies; and 6) transnational nineteenth-century studies.

### Admission Requirements

Admission to the PhD Program normally requires an MA in English, and MA in Drama/Theatre, or an equivalent degree with at least an A- average in graduate work. In certain exceptional circumstances, students will be considered directly out of the undergraduate degree. Applications are considered by the Graduate Program Committee and a recommendation to admit or decline is forwarded to the Assistant VP of Graduate Studies.

### Program Requirements

#### Graduate Course Work (2.5 credits)

Students are required to take 5 graduate courses in the initial phase of their degree. The standard practice is to take two courses in the Fall semester of Year 1, two courses in the Winter semester of Year 1, and one course in the Fall semester of Year 2. This arrangement of courses is recommended, but remains flexible: any combination of 5 courses over these semesters is acceptable. In unusual circumstances, students may petition to do one course in the Winter semester of Year 2 in order to meet particular demands in their program of study. Courses are advertised on a two-year cycle to maximize choice and facilitate planning in the program.

Graduate courses allow students to develop their knowledge of key theoretical, historical and critical concerns for the analysis of culture. It is during coursework that students hone their skills in writing and research so that they will be prepared for the challenges posed by their Primary and Secondary Area Qualifications. Students are encouraged to choose their courses in order to maximize their critical and historical repertoire, and to take advantage of the opportunity afforded by the program to work across the disciplines of English and Theatre Studies.

#### Language Requirement--LTS\*7770 (0.0 credit)

Doctoral students are required to demonstrate reading proficiency in at least one language other than modern English, as approved by the Graduate Study Committee. Typically the language requirement will be completed by the end of the student's fifth semester in the program.

The language should normally have direct relevance to the student's program of study. In certain cases, students' research may require demonstrable competency in a non-written or technical language such as a programming language. The selection of the language(s) will be determined by the student in consultation with the dissertation advisor, and must be submitted for approval by the Graduate Program Committee.

The language requirement may be fulfilled through one of the following:

- A three-hour examination, which consists of the student's translation (with the help of a dictionary) of one passage in prose of not more than 1000 words.
- A faculty member with expertise in the language grades the examination on a pass/fail basis. A student who fails the language examination twice will normally be required to withdraw from the program.
- Equivalent language requirement through an MA-level examination.
- An undergraduate-level language course or above whose completion demonstrates reading proficiency in the language (as determined by the student's committee and approved by the Graduate Program Committee).

The student's advisory committee may submit a rationale, no later than the end of the third semester of study, to the Graduate Program Committee explaining why a second language is not necessary to the course of study. In order to promote equity across the program, the Graduate Program Committee will be charged with approving or rejecting that rationale or requesting further clarification.

### Secondary Area Qualification

The SAQ takes place in the Summer of Year One and provides an opportunity for students to quickly develop the repertoire needed to potentially teach in a field without necessarily committing to that field as an area of specialization. The objective here is to gain working knowledge of the major texts and statements relating to a field of scholarly enquiry. Upon completion of this exercise, students should have both the range and the depth to confidently teach in a secondary area.

As the name implies, this is a qualification exercise. The student is responsible for a reading list comprised of 60 texts, (the definition of what constitutes a standard text is internal to the design of the lists) selected from standard department reading lists; 30% of the list may be altered to suit particular interests. Students are assessed on a pass/fail basis on the following:

1. The student will write a three-hour examination composed of four questions, from which the student chooses two. These questions give the student an opportunity to demonstrate the range and depth of their reading. The questions will ask the student to place a range of primary texts in relation to key critical debates in the field.
2. This written examination is followed one week later by a one-hour oral examination on questions arising from both elements of the written work.

### Primary Area Qualification (Year 2)

After the completion of the SAQ, the student progresses to his or her Primary Area Qualification. The objective here is to develop sufficient expertise in a field of scholarly enquiry to be able to make original contributions to that field through the writing of a doctoral dissertation. Through discussion with his or her advisory committee, the student develops a reading list of approximately 120 works divided roughly into two parts. The first comprises a Field Survey that is aimed at sketching the broad contours of an area of scholarly enquiry. The second is a more specific articulation of the works, called the Topic Readings, that will immediately impinge on the dissertation. The PAQ Examination, intended to determine whether the student is prepared to write and capable of writing the PhD thesis, is usually taken 12 months after the completion of the SAQ:

1. A three-hour examination on the primary material to be studied in the thesis and on scholarship concerning that primary material-i.e. this is directed specifically to the Topic Readings. The student will be asked to answer two questions from a choice of three.
2. A three-hour examination on the immediate background--the literary, cultural and intellectual milieu of the subject being studied-i.e. this is directed specifically at the Field Survey. The student will be asked to answer two questions from a choice of three.
3. A two-hour oral examination in which the examining committee usually follows up on material in the written examinations and questions the student on plans for the doctoral thesis. While the examination is likely to focus on the student's main area of interest, examiners also have the lee-way to ask questions pertaining to the overall list of texts.

Students are assessed on a pass/fail basis.

### Dissertation Prospectus

Immediately following the Primary Area Qualification, the student develops, in consultation with his or her advisory committee, a full prospectus for their dissertation. The prospectus states the overall objective of the thesis, lays out the chapter structure, and summarizes the issues and concerns to be addressed in each chapter. If and when the Dissertation Committee ratifies the Prospectus, it is forwarded to the Graduate Program Committee for formal approval.

### PhD Dissertation

Following successful completion of the two Area Qualifications, the student must complete an original research project on an advanced topic. The advisory committee for the dissertation will consist of three members of the graduate faculty, one of whom assumes the primary advisory role. Ideally, the dissertation supervisor has worked with the student, in an advisory capacity, from her/his first semester in the program.

Each candidate shall submit a thesis, written by the candidate, on the research carried out by the candidate on an approved topic. The thesis is expected to be a significant contribution to knowledge in its field and the candidate must indicate in what ways it is a contribution. The thesis must demonstrate mature scholarship and critical judgement on the part of the candidate and it must indicate an ability to express oneself in a satisfactory literary style. Approval of the thesis is taken to imply that it is judged to be sufficiently meritorious to warrant publication in reputable scholarly media in the field.

The dissertation should normally be between 50,000 and 75,000 words in length. The regulations for submission, examination and publication are outlined in Chapter IV PhD Degree Regulations.

### Courses

#### LTS\*7770 Language Requirement U [0.00]

A written demonstration of a student's reading knowledge of one language other than English, as approved by the Graduate Studies Committee.

*Department(s):* School of English and Theatre Studies

#### LTS\*7900 Directed Studies U [0.50]

The study of a special topic under the guidance of a member of the graduate faculty.

*Department(s):* School of English and Theatre Studies

THST*6150	[0.50]	Theatre Historiography
THST*6210	[0.50]	Devising
THST*6220	[0.50]	Theatre Theory
THST*6230	[0.50]	Performance and Difference
THST*6250	[0.50]	Bodies and Space in Performance
THST*6801	[0.50]	Reading Course I
THST*6802	[0.50]	Reading Course II
ENGL*6002	[0.50]	Topics in the History of Criticism
ENGL*6003	[0.50]	Problems of Literary Analysis
ENGL*6201	[0.50]	Topics in Canadian Literature

ENGL*6209	[0.50]	Topics in Colonial, Postcolonial and Diasporic Literature
ENGL*6412	[0.50]	Topics in Medieval/Renaissance Literature
ENGL*6421	[0.50]	Topics in Eighteenth Century and Romantic Literature
ENGL*6431	[0.50]	Topics in Nineteenth Century Literature
ENGL*6441	[0.50]	Topics in Modern British Literature
ENGL*6451	[0.50]	Topics in American Literature
ENGL*6611	[0.50]	Topics in Women's Writing
ENGL*6621	[0.50]	Topics in Children's Literature
ENGL*6641	[0.50]	Topics in Scottish Literature
ENGL*6691	[0.50]	Interdisciplinary Studies
ENGL*6811	[0.50]	Special Topics in English
ENGL*6801	[0.50]	Reading Course I
ENGL*6802	[0.50]	Reading Course II

## Management

The MA in Management offers opportunities for study in the fields of:

- Management Research
- Accounting

The objective of the PhD in Management is to prepare individuals who already have a strong background in a management area such as marketing, organizational behaviour, leadership, hospitality / tourism, quality management, economics, finance, or human resources to be academic scholars. This program prepares individuals with solid, formal foundations in theory and practice.

The PhD in Management is a thesis-based program that is offered through the College of Business and Economics. The participating academic units are the Department of Marketing and Consumer Studies (MCS), the Department of Management (DoM) and the School of Hospitality, Food and Tourism Management (HFTM). The PhD in Management has three fields:

- Marketing and Consumer Behaviour
- Organizational Leadership
- Services Management

which are offered jointly by the three academic units.

### Administrative Staff - MA Program

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#### Julia Christensen Hughes

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#### Jing Lu

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#### Trent Tucker

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#### John Walsh

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#### Agnes Zdaniuk

BA, MAsC, PhD Waterloo - Assistant Professor

### Graduate Faculty - PhD Program

#### From the Department of Marketing and Consumer Studies

##### Paul M. Anglin

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##### May H. Aung

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##### Scott R. Colwell

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##### Tim Dewhirst

BPHE Toronto, MA Queen's, PhD British Columbia - Associate Professor

##### Tirtha Dhar

BA, MA Delhi University, MSc, PhD University of Connecticut - Associate Professor and Chair

##### Towhidul Islam

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##### Vinay Kanetkar

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##### William Murray

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##### Lefa Teng

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##### Juan Wang

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##### Sunghwan Yi

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##### Jian Zhou

BA, MA Renmin (China), PhD Illinois (Chicago) - Assistant Professor

#### From the School of Hospitality, Food and Tourism Management

##### Joe Barth

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##### Hwan-Suk (Chris) Choi

BA Chung-Ang (Seoul, Korea), MTA George Washington, PhD Texas A&M - Associate Professor

##### Statia Elliot

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##### Kerry Godfrey

BSc Victoria, MSc Surrey, PhD Oxford Brookes, MBA Leicester - Professor and Associate Dean Academic

#### **WooMi Jo**

BS Kansas, MS Houston, PhD Kansas - Associate Professor

#### **Marion Joppe**

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#### **Tanya MacLaurin**

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#### **Iain Murray**

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### **From the Department of Management**

#### **Ron Baker**

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### **Graduate Faculty - Graduate Diploma**

#### **Ron Baker**

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#### **Louise Hayes**

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#### **Kalinga Jagoda**

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#### **Philippe Lassou**

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#### **Jing Lu**

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#### **Davar Rezanian**

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#### **Sandra Scott**

BSc Toronto, MBA McMaster, CPA, CA, CFA - Assistant Professor

### **MA Program**

The Master of Arts in Management focuses on the challenges that face leaders in the public, private and, not-for-profit sectors while emphasizing the importance of evidence-based decision-making. Successful completion of the MA degree involves a comprehensive program of theoretical study, backed by significant practical experience and analysis. Graduate students will also undertake a formal self-assessment process to gain insight into their own strengths and weaknesses as well as into their ultimate leadership potential.

The MA in Management has two fields:

1. Management Research, with emphasis on evidence-based decision-making, is designed to equip students with the necessary skills to support managerial decision, with evidence-based reasoning. Students will engage in both web-based distance and on campus courses. The completion of a major research project will also be undertaken during the course of the degree.
2. Accounting, combines the conceptual and quantitative elements of accounting, while promoting the integration of theory and practice. It provides graduates with a systemic understanding of knowledge of financial accounting and managerial accounting. All the while, fulfilling the requirements of the professional accounting standards defined by CPA Canada Competency Map for the first four modules of the Professional Education Program. Students will develop the technical, analytical, evaluative, leadership and, communication skills needed for a successful career in accounting and the related management areas in the field/profession.

### **Admission Requirements**

To be considered, applicants must have completed a four-year honours undergraduate degree with a minimum 2nd class (70%) (or its equivalent), from a recognized post-secondary institution. For the specialization in Accounting, subject area coverage should be equivalent to that required for entry into the CPA Professional Education Program.

For applicants who do not hold an honours degree with a major in or possess an undergraduate degree with a strong emphasis in either the accounting and/or management fields, additional prerequisites or academic upgrading may be required.

Any applicant who believes that their experiential learning may compensate for a lack of academic standing and subsequently, does not meet the programs minimum requirements, may contact the Graduate Program Coordinator to request alternative admissions criteria. Experiential learning would require at a general degree and 5 years in a research or equivalent position in the accounting or management field and/or professional industry. Further, for applicants who wish to request alternative admission criteria based on their experiential learning, they may be required to provide, a valid Graduate Management Admissions Test (GMAT) score and/or a valid Graduate Record Examination (GRE) written test.

### **Degree Requirements**

Students are required to take 8 courses (4.0 credits) plus the major research project (1.0 credit).

#### **Core Courses:**

MGMT*6100	[0.50]	Evidence Based Management Research
MGMT*6200	[0.50]	Leadership Assessment and Development

#### **Fields**

#### **Management Research**

MGMT*6300	[0.50]	Business Consulting
MGMT*6400	[0.50]	Project Management
BUS*6800	[0.50]	Readings in Leadership I
BUS*6810	[0.50]	Readings in Leadership II
BUS*6820	[0.50]	Readings in Management
BUS*6840	[0.50]	Foundational Theories of Management

#### **Accounting**

ACCT*6100	[0.50]	Integrated Cases I
ACCT*6200	[0.50]	Integrated Cases II
ACCT*6300	[0.50]	Taxation
ACCT*6400	[0.50]	Performance Management
ACCT*6500	[0.50]	Assurance
ACCT*6600	[0.50]	Financial Management

Other courses from the Department of Management with permission from the Graduate Program Coordinator.

## Restricted Electives

One quantitative research methods course (0.5 credits) with permission:

MGMT*6830	[0.50]	Applied Univariate Statistical Analysis for Management
MGMT*6840	[0.50]	Quantitative Research Methods: Multivariate Techniques
SOC*6130	[0.50]	Quantitative Research Methods
PSYC*6060	[0.50]	Research Design and Statistics

Or one qualitative research methods course (0.5 credits) with permission:

ANTH*6140	[0.50]	Qualitative Research Methods
FRAN*6020	[0.50]	Qualitative Methods
MGMT*6850	[0.50]	Qualitative Research Methods
SOC*6140	[0.50]	Qualitative Research Methods

## Major Research Paper

MGMT*6500	[1.00]	Major Research Project
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## PhD Program

The PhD in Management is offered in three fields: 1) marketing and consumer behaviour; 2) organizational leadership; and 3) services management.

## Admission Requirements

There are three means of entry:

1. An applicant who holds a recognized master's degree in a management field with an average standing of at least "B+" may be admitted to PhD studies as a regular or provisional student
2. An applicant who holds a recognized master's degree with high standing in a field other than management and who wishes to proceed to doctoral study in a management field should consult with the Graduate Program Coordinator about eligibility.
3. An applicant who has achieved excellent standing at the honours baccalaureate level in a management field and who wishes to proceed to doctoral study may enroll in a related master's degree. If the student achieves a superior academic record and shows a particular aptitude for research, the Board of Graduate Studies, on the recommendation of the Department/School admissions committee, may authorize transfer to the PhD program without requiring the student to complete the master's degree.

All applicants are required to submit GRE (Graduate Records Exam) or GMAT (Graduate Management Admission Test).

## Degree Requirements

The goal of the PhD program in Management is to produce graduates with both a breadth of knowledge about management theories in general, and a depth of knowledge such that they will be competent researchers and/or teachers in their chosen field. Since most courses will be common to the current three fields in this program as well as to any future fields, the key indicator of the student's area of specialization will be his or her thesis topic. Students should select all courses in consultation with the Graduate Program Coordinator and their supervisor. Students with an existing Master's degree awarded by the College of Business and Economics, who have already taken some of the required courses as part of their graduate program, will be exempted from those course requirements.

Students in all fields of the program will take five core courses that will ensure that each student has a breadth of knowledge about management and research. Of the five core courses, one will cover the theories and practice of management, another provides an understanding of the philosophy of research and design, two courses cover quantitative research and the fifth covers qualitative research methodologies. In addition to the five core courses, there are two required field courses in the first year specific to each field. In the second year students select two additional required courses and two elective courses in their field in consultation with the program coordinator. All students must take the University teaching course in the fall of the second year, bringing the total number of 0.5 credit courses to twelve. In addition, all students must write a paper in a non-credit course the summer of the first year and attend every year a non-credit seminar series course that introduces students to the diversity of research projects undertaken by Guelph faculty, graduate students and by visitors to the University. Following their coursework, students will complete a comprehensive exam designed to test their knowledge in the general area of management and in their field of specialization. Students are to present and defend a doctoral research proposal in the semester after completion of the qualifying examination.

Overall, the proposed program consists of five semesters of coursework (five core courses, four required field courses, two electives and the teaching course), followed by the qualifying exam, presentation and defense of a research proposal, and finally, the completion and defense of a full doctoral dissertation.

Students are required to take a total of 6.0 credits (12 courses), the PhD Research Project Seminar course in the third (summer) semester (0.0 credit) and the Marketing & Consumer Studies Seminar course (0.0 credit) each fall and winter semester the student is registered.

## Year 1

### Semester 1

MGMT*6950	[0.00]	Doctoral Research Seminar
MGMT*6820	[0.50]	Theory of Management
MGMT*6830	[0.50]	Applied Univariate Statistical Analysis for Management
Required field course		

Marketing and Consumer Behaviour: one of

MCS*6000	[0.50]	Consumption Behaviour Theory I
MCS*6100	[0.50]	Marketing Theory
Organizational Leadership		
BUS*6830	[0.50]	Foundational Theories of Leadership
Services Management		
HTM*6710	[0.50]	Services Management Theory I

## Note

MGMT\*6830 can be substituted with PSYC\*6060 Research Design and Statistics or with STAT\*6950 Statistical Methods for Life Sciences, upon recommendation from the Graduate Program Coordinator.

## Semester 2

MGMT*6950	[0.00]	Doctoral Research Seminar
MGMT*6840	[0.50]	Quantitative Research Methods: Multivariate Techniques
MGMT*6850	[0.50]	Qualitative Research Methods
Required field course		

Marketing and Consumer Behaviour: one of

MCS*6010	[0.50]	Consumption Behaviour Theory II
MCS*6120	[0.50]	Marketing Management
Organizational Leadership		
BUS*6840	[0.50]	Foundational Theories of Management
Services Management		
HTM*6720	[0.50]	Services Management Theory II

## Semester 3

MGMT*6800	[0.50]	Philosophy of Social Science Research
MGMT*6900	[0.00]	PhD Research Seminar Project

## Year 2

### Semester 4

MGMT*6950	[0.00]	Doctoral Research Seminar
UNIV*6800	[0.50]	University Teaching: Theory and Practice
Required field course		

Marketing and Consumer Behaviour: one of

ECON*6600	[0.50]	Labour Economics
MCS*6070	[0.50]	Introduction to Structural Equation Modeling
MCS*6810	[0.50]	Experimental Design and Analysis for Behavioural Research in Management Studies

## Note

The field course can be replaced by a course in Psychological Methods or Marketing Models upon agreement from program coordinator.

Organizational Leadership: one of

BUS*6800	[0.50]	Readings in Leadership I
BUS*6820	[0.50]	Readings in Management
Services Management: One of theory or methods courses:		
ECON*6000	[0.50]	Microeconomic Theory I
ECON*6140	[0.50]	Econometrics I
FARE*6380	[0.50]	Applied Microeconomics for Agricultural Economists
MCS*6000	[0.50]	Consumption Behaviour Theory I
MCS*6070	[0.50]	Introduction to Structural Equation Modeling
MCS*6100	[0.50]	Marketing Theory

**All fields: One elective course [0.50]**

**The elective course can be one from the required courses list or another course from the list below.** Other electives from other University of Guelph academic units can be considered if agreed to by the Graduate Program Coordinator.

HTM*6730	[0.50]	Cases in Management
MCS*6800	[0.50]	Best Worst Scaling and Discrete Choice Analysis
TRMH*6100	[0.50]	Foundations of Tourism and Hospitality
TRMH*6200	[0.50]	Contemporary Issues in Tourism
TRMH*6250	[0.50]	Tourism and Sustainable Development
TRMH*6310	[0.50]	Research Applications in Tourism and Hospitality
BU*842	[0.50]	Consumer Behavior, Marketing, Wilfrid Laurier
BU*862	[0.50]	Research in Brand and Product Management, Marketing, Wilfrid Laurier
SOC*760	[0.50]	Social Networks, Department of Sociology and Legal Studies, University of Waterloo

## Semester 5

MGMT*6950	[0.00]	Doctoral Research Seminar
Required field course		

Marketing and Consumer Behaviour: one of

ECON*6160	[0.50]	Econometrics II
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ECON*6610	[0.50]	Topics in Labour Economics
One course in Psychology/ Sociology/ Microeconomics/Econometrics/ Economics/Marketing/Consumer Behaviour/ upon agreement with program co-ordinator		
Organizational Leadership: one of		
BUS*6810	[0.50]	Readings in Leadership II
Services Management: One of theory or methods courses:		
ANTH*6140	[0.50]	Qualitative Research Methods
BUS*6810	[0.50]	Readings in Leadership II
ECON*6010	[0.50]	Microeconomic Theory II
ECON*6100	[0.50]	Experimental Economics
FARE*6970	[0.50]	Applied Quantitative Methods for Agricultural Economists
MCS*6010	[0.50]	Consumption Behaviour Theory II

#### All fields: One elective course [0.50]

The elective course can be one from the required courses list or another course from the list below. Other electives from other University of Guelph academic units can be considered if agreed to by the Graduate Program Coordinator.

HTM*6730	[0.50]	Cases in Management
MCS*6800	[0.50]	Best Worst Scaling and Discrete Choice Analysis
TRMH*6100	[0.50]	Foundations of Tourism and Hospitality
TRMH*6200	[0.50]	Contemporary Issues in Tourism
TRMH*6250	[0.50]	Tourism and Sustainable Development
TRMH*6310	[0.50]	Research Applications in Tourism and Hospitality
BU*842	[0.50]	Consumer Behavior, Marketing, Wilfrid Laurier
BU*862	[0.50]	Research in Brand and Product Management, Marketing, Wilfrid Laurier
SOC*760	[0.50]	Social Networks, Department of Sociology and Legal Studies, University of Waterloo

Qualifying Examination

#### Semester 6

Thesis Proposal Defence

#### Year 3

#### Semester 7, 8 & 9

MGMT*6950	[0.00]	Doctoral Research Seminar
Thesis Research		

#### Year 4

#### Semester 10, 11 & 12

MGMT*6950	[0.00]	Doctoral Research Seminar
Thesis Research and Defence		

### Graduate Diploma in Accounting

By combining the conceptual and quantitative elements of accounting while promoting the integration of theory and practice, the graduate diploma in accounting provides graduates with a systemic understanding of knowledge of financial accounting and managerial accounting, fulfilling the requirements of professional accounting standards defined by CPA Canada Competency Map for the first four modules of the Professional Education Program. Students will develop the technical, analytical, evaluative and leadership and communication skills needed for a successful career in accounting and related management areas.

### Admission Requirements

Applicants for this admission to this program must have an overall average of at least 70% from an undergraduate degree program, plus subject area coverage equivalent to that required for entry into the CPA Professional Education Program.

### Diploma Requirements

Students must complete four courses, two core and two electives for a total of 4.0 credits. Students pursuing a professional accounting designation should visit the Department of Management website for links to the requirements for each designation. The program is offered during the summer term

#### Core Courses:

ACCT*6100	[0.50]	Integrated Cases I
ACCT*6200	[0.50]	Integrated Cases II

#### Electives

ACCT*6300	[0.50]	Taxation
ACCT*6400	[0.50]	Performance Management
ACCT*6500	[0.50]	Assurance
ACCT*6600	[0.50]	Financial Management

### MA Courses

#### Core Courses

##### MGMT\*6100 Evidence Based Management Research U [0.50]

This course provides a conceptual overview of the management research and its functions for academic and practitioner audiences. Students will explore the purpose of research, its relationship to theory, the benefits of various epistemological approaches and the notion of research impact. Topics include research problem definition and objectives, hypothesis development, research design, ethics approval, measurement, sampling methods, analysis, interpretation of results, and report writing.

*Restriction(s):* Students in MA.MGMT

*Department(s):* Department of Management

##### MGMT\*6120 Quantitative Methods for Evidence Based Management U [0.50]

This course provides a practical overview of statistical methods for evidence-based management applications. Students will work with quantitative data to conduct a variety of statistical analysis, including descriptive statistics, visualization of data, null hypothesis significance testing, univariate and multivariate analysis of variance and covariance, correlation, linear and logistic regression and exploratory factor analysis. The course puts an emphasis on the interpretation of results in terms of their practical managerial implications.

*Prerequisite(s):* MGMT\*6100

*Restriction(s):* Students in MA.MGMT

*Department(s):* Department of Management

##### MGMT\*6200 Leadership Assessment and Development U [0.50]

This course provides a conceptual overview of the leadership competencies that lead to leadership performance. Students will explore and learn a method for assessing their own leadership competencies. They will learn a process for developing in themselves those knowledge and skills relevant to effective leadership. Topics include managerial competencies models, assessment models, learning styles, intentional change process, and personal development plan. This course emphasizes those techniques most frequently used in personal development and coaching individuals and teams.

*Restriction(s):* Students in the MA in Management program only.

*Department(s):* Department of Management

##### MGMT\*6500 Major Research Project U [1.00]

This course is available to individuals or groups of graduate students. Students will complete a set of readings and an associated paper as approved by designated faculty. Specific learning objectives consistent with the University's will be developed each time the course is offered.

*Prerequisite(s):* MGMT\*6100 and MGMT\*6200

*Restriction(s):* Students in the MA in Management program.

*Department(s):* Department of Management

### Management Research

##### MGMT\*6300 Business Consulting U [0.50]

This course provides students with an understanding of the concepts, principles, and practices for management consulting. Students will be exposed to the various components of the consulting process, consulting approaches and styles, client- consultant relationships, issue and problem diagnosis, reporting of results, and professional codes of conduct and ethics. The emphasis is on techniques most frequently used in the context of both internal and external organizational roles and as a career choice.

*Restriction(s):* Students in the MA in Management program only.

*Department(s):* Department of Management

##### MGMT\*6400 Project Management U [0.50]

This course provides students with an understanding of the concepts, principles, and practices for project management. It introduces an understanding and appreciation of the importance of managing projects, project teams, the project management systems and tools, the various components of the project management process, and professional codes of conduct and ethics. The emphasis is on the techniques most frequently used in the context of, both internal and external organizational roles of a project manager.

*Restriction(s):* Students in the MA in Management program only.

*Department(s):* Department of Management

##### BUS\*6800 Readings in Leadership I U [0.50]

This course is available to individuals or groups of graduate students. Students will complete a set of readings and an associated paper as approved by designated faculty. Specific learning objectives consistent with the University's will be developed each time the course is offered.

*Department(s):* Executive Programs

**BUS\*6810 Readings in Leadership II U [0.50]**

This course is available to individuals or groups of graduate students. Students will complete a set of readings and an associated paper as approved by designated faculty. Specific learning objectives consistent with the University's will be developed each time the course is offered.

*Prerequisite(s):* BUS\*6800 (or may be taken concurrently)

*Department(s):* Department of Management

**BUS\*6820 Readings in Management U [0.50]**

This course is available to individuals or groups of graduate students. Students will complete a set of readings and an associated paper as approved by designated faculty. Specific learning objectives consistent with the University's will be developed each time the course is offered.

*Department(s):* Department of Management

**BUS\*6840 Foundational Theories of Management W [0.50]**

This doctoral seminar provides a survey of classic and contemporary management thought. The objective of this course is to explore foundational and emerging areas of inquiry that are influential in the realm of management theory and practice.

*Restriction(s):* Instructor consent required.

*Department(s):* Department of Management

**Accounting****ACCT\*6100 Integrated Cases I U [0.50]**

"Integrated Cases I" is a required course for students pursuing a Chartered Professional Accountant (CPA) designation and will provide students with an in-depth knowledge of financial reporting and auditing. The course will integrate topics from both the finance and taxation areas of the CPA competency map. The course will also assist students in developing their problem solving and decision making abilities and communication skills, which are part of the enabling competencies of the CPA competency map.

*Restriction(s):* Students in MA.MGMT and GDip.ACCT

*Department(s):* Department of Management

**ACCT\*6200 Integrated Cases II U [0.50]**

"Integrated Cases II" is a required course for students pursuing a Chartered Professional Accountant (CPA) designation and will provide students with an in-depth knowledge of management accounting. The course will integrate topics from both the strategy and governance and the finance areas of the CPA competency map. The course will also assist students in developing their problem solving and decision-making abilities and communication skills, which are part of the enabling competencies of the CPA competency map.

*Restriction(s):* Students in MA.MGMT and GDip.ACCT

*Department(s):* Department of Management

**ACCT\*6300 Taxation F [0.50]**

This course is intended to help students achieve the competencies related to Elective Module 4 (E4) – Taxation in the CPA Competency Map. It covers the competencies necessary to provide taxation services and guidance. Topics include: compliance and tax-planning issues for both individuals and corporate entities, as well as, partnerships and trusts, risk tolerance of all stakeholders involved, tax governance, controls, and risk management, and the importance of taking taxes into account when making business and investment decisions..

*Prerequisite(s):* ACCT\* 6100 and ACCT\*6200

*Restriction(s):* Students in MA.MGMT and GDip.ACCT

*Department(s):* Department of Management

**ACCT\*6400 Performance Management U [0.50]**

Performance Management is an elective course for students pursuing a Chartered Professional Accountant (CPA) designation and will build on student's management accounting knowledge from both their undergraduate courses as well as "Integrated Cases II". The course will also assist students in further developing their problem solving and decision-making abilities and communication skills, which are part of the enabling competencies of the CPA competency map.

*Prerequisite(s):* ACCT\*6200

*Restriction(s):* Students in MA.MGMT and GDip.ACCT

*Department(s):* Department of Management

**ACCT\*6500 Assurance U [0.50]**

This course develops the competencies necessary to assess an entity's assurance needs and perform both internal audit projects and external assurance engagements. The CPA Competency Map describes in detail the two types of competencies - technical and enabling - that employers in public practice, industry, and government require of accounting professionals. As such, the CPA Competency Map will be utilized in this course to help ensure that students meet the course learning objectives.

*Restriction(s):* Students in MA.MGMT and GDip.ACCT

*Department(s):* Department of Management

**ACCT\*6600 Financial Management U [0.50]**

The course will build upon the conceptual foundation developed in undergraduate introductory finance courses. The focus of the course is on the development of competencies in identifying, analyzing, evaluating and making appropriate recommendations for investing and financing decisions in a variety of professional contexts, particularly in the areas of treasury management, valuation, and risk management. There will be a strong emphasis on applying the body of knowledge in integrated case problems.

*Restriction(s):* Students in MA.MGMT and GDip.ACCT

*Department(s):* Department of Management

**PhD Core Courses****Required Courses****MGMT\*6800 Philosophy of Social Science Research S [0.50]**

This course introduces students to the underlying philosophical assumptions that support empirical research methods within social science disciplines. The aim of this course is to examine the philosophy of knowledge generation and claims, particularly in the context of management phenomena.

*Department(s):* Department of Marketing and Consumer Studies

**MGMT\*6820 Theory of Management F [0.50]**

This course examines the evolution of management thought and the overarching theories that have been successfully applied to multiple functional areas of the organization. Examples of theories that apply to such disparate areas as operations, marketing, and organizational behaviour include agency theory, transaction cost analysis, and contingency theory.

*Department(s):* Department of Management

**MGMT\*6830 Applied Univariate Statistical Analysis for Management F [0.50]**

This course focuses on the use of univariate statistics as applied to social and behavioural research within the fields of organizational, management, and consumer studies. Emphasis will be place on providing a solid understanding of descriptive statistics, mean difference testing, analysis of variance and covariance, linear and logistic regression, and power and effect size. Laboratory sessions will focus on analysis application using statistical packages such as SPSS, R, SAS, Stata, and Mplus.

*Department(s):* Department of Management

**MGMT\*6840 Quantitative Research Methods: Multivariate Techniques W [0.50]**

This course provides a review of selected multivariate analysis techniques with applications to management. Students will learn to determine which multivariate technique is appropriate for a specific research problem and how to apply multivariate quantitative techniques to research questions. Topics include regression analysis, anova, principal components, factor and discriminant analysis, nonmetric scaling and trade-off analysis. The course uses a hands-on approach and requires computer-program analysis.

*Department(s):* Department of Management

**MGMT\*6850 Qualitative Research Methods W [0.50]**

This doctoral seminar provides students with the historical roots, underlying theoretical frameworks, and methods of qualitative research for consumer and management studies. Students will develop their capacity to conduct qualitative research through the development of an original qualitative research project.

*Department(s):* Department of Management

**MGMT\*6900 PhD Research Seminar Project S [0.00]**

The summer project seminar has the objective to start familiarizing students with the research process. Students will prepare and submit a research piece drawing on techniques acquired in the research methods courses.

*Department(s):* Department of Management

**MGMT\*6950 Doctoral Research Seminar F,W [0.00]**

This is a seminar course attended by graduate students and faculty. Academic guest speakers present their work in weekly meetings. Students are encouraged to be engaged and participate actively during the presentations.

*Restriction(s):* Must be registered in the PhD Management program

*Department(s):* Department of Management

**Field Courses**

BUS*6830	[0.50]	Foundational Theories of Leadership
BUS*6840	[0.50]	Foundational Theories of Management
HTM*6710	[0.50]	Services Management Theory I
HTM*6720	[0.50]	Services Management Theory II
HTM*6730	[0.50]	Cases in Management
MCS*6800	[0.50]	Best Worst Scaling and Discrete Choice Analysis
MCS*6810	[0.50]	Experimental Design and Analysis for Behavioural Research in Management Studies

## Graduate Diploma Courses

### ACCT\*6100 Integrated Cases I U [0.50]

“Integrated Cases I” is a required course for students pursuing a Chartered Professional Accountant (CPA) designation and will provide students with an in-depth knowledge of financial reporting and auditing. The course will integrate topics from both the finance and taxation areas of the CPA competency map. The course will also assist students in developing their problem solving and decision making abilities and communication skills, which are part of the enabling competencies of the CPA competency map.

*Restriction(s):* Students in MA.MGMT and GDip.ACCT

*Department(s):* Department of Management

### ACCT\*6200 Integrated Cases II U [0.50]

“Integrated Cases II” is a required course for students pursuing a Chartered Professional Accountant (CPA) designation and will provide students with an in-depth knowledge of management accounting. The course will integrate topics from both the strategy and governance and the finance areas of the CPA competency map. The course will also assist students in developing their problem solving and decision-making abilities and communication skills, which are part of the enabling competencies of the CPA competency map.

*Restriction(s):* Students in MA.MGMT and GDip.ACCT

*Department(s):* Department of Management

### ACCT\*6300 Taxation F [0.50]

This course is intended to help students achieve the competencies related to Elective Module 4 (E4) – Taxation in the CPA Competency Map. It covers the competencies necessary to provide taxation services and guidance. Topics include: compliance and tax-planning issues for both individuals and corporate entities, as well as, partnerships and trusts, risk tolerance of all stakeholders involved, tax governance, controls, and risk management, and the importance of taking taxes into account when making business and investment decisions..

*Prerequisite(s):* ACCT\* 6100 and ACCT\*6200

*Restriction(s):* Students in MA.MGMT and GDip.ACCT

*Department(s):* Department of Management

### ACCT\*6400 Performance Management U [0.50]

Performance Management is an elective course for students pursuing a Chartered Professional Accountant (CPA) designation and will build on student’s management accounting knowledge from both their undergraduate courses as well as “Integrated Cases II”. The course will also assist students in further developing their problem solving and decision-making abilities and communication skills, which are part of the enabling competencies of the CPA competency map.

*Prerequisite(s):* ACCT\*6200

*Restriction(s):* Students in MA.MGMT and GDip.ACCT

*Department(s):* Department of Management

### ACCT\*6500 Assurance U [0.50]

This course develops the competencies necessary to assess an entity's assurance needs and perform both internal audit projects and external assurance engagements. The CPA Competency Map describes in detail the two types of competencies - technical and enabling - that employers in public practice, industry, and government require of accounting professionals. As such, the CPA Competency Map will be utilized in this course to help ensure that students meet the course learning objectives.

*Restriction(s):* Students in MA.MGMT and GDip.ACCT

*Department(s):* Department of Management

### ACCT\*6600 Financial Management U [0.50]

The course will build upon the conceptual foundation developed in undergraduate introductory finance courses. The focus of the course is on the development of competencies in identifying, analyzing, evaluating and making appropriate recommendations for investing and financing decisions in a variety of professional contexts, particularly in the areas of treasury management, valuation, and risk management. There will be a strong emphasis on applying the body of knowledge in integrated case problems.

*Restriction(s):* Students in MA.MGMT and GDip.ACCT

*Department(s):* Department of Management

## Marketing and Consumer Studies

Faculty and graduate students in the Department of Marketing and Consumer Studies share a focus on the multi-disciplinary examination of consumer behaviour and marketplace phenomena. The fields of emphasis are:

- Consumer Behaviour
- Marketing

Central to the department's research and graduate teaching program is to help key stakeholders (businesses and policy makers) make informed decisions, formulate effective strategies and policies, improve economic welfare, and facilitate sustainable development by advancing their understanding of consumer decision making and consumer well-being. The department's graduate program leads to the master of science degree in marketing and consumer studies with a strong focus on theory and advanced methodologies.

### Administrative Staff

#### Chair

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### Graduate Faculty

#### Paul M. Anglin

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#### May H. Aung

BComm, MComm Burma, PhD York - Associate Professor

#### Scott R. Colwell

AGD, MBA Athabasca, PhD Bradford (United Kingdom) - Associate Professor

#### Avis Devine

BS Westminster College, MBA Duquesne University, PhD Cincinnati - Assistant Professor

#### Tim Dewhirst

BPHE Toronto, MA Queen's, PhD British Columbia - Associate Professor

#### Tirtha Dhar

MA Delhi, MSc, PhD Connecticut - Associate Professor and Chair

#### Towhidul Islam

MSc Inst. of Mech. Tech. (Bulgaria), MBA Dhaka (Bangladesh), DIC Imperial College (United Kingdom), PhD London (United Kingdom) - Professor

#### Vinay Kanetkar

BArch Indian Inst. of Tech, MArch, MSc, PhD British Columbia - Associate Professor

#### Tanya Mark

BA, PhD Western Ontario - Associate Professor

#### Brent McKenzie

BA, McMaster, MBA Dalhousie, PhD Griffith - Associate Professor

#### Lefa Teng

BEng Jiangsu, MSc Beijing, PhD Concordia - Associate Professor

#### Juan Wang

BBA Nanjing, MSc Guelph, PhD Western - Assistant Professor

#### Sunghwan Yi

BBA, MBA Seoul National, PhD Pennsylvania State - Associate Professor

#### Jian Zhou

BA, MA Renmin, PhD Illinois (Chicago) - Associate Professor

### MSc Program

The MSc program is offered in two fields: 1) consumer behaviour; and 2) marketing and draws on a variety of disciplines for theory, concepts, and research methods. Students are required to successfully complete five departmental core courses; consumption behaviour theory, marketing theory, and three graduate courses in measurement and analysis. One elective course is selected by the student in conjunction with the Graduate Program Coordinator and/or his/her advisory committee and is normally chosen to provide theoretical, conceptual, and/or methodological background for the thesis. Each student is also required to attend the department's graduate seminar for the duration of his or her program.

A significant number of graduate students in marketing and consumer studies direct their course work and thesis research toward applications related to marketing within private, public, and non-profit sector organizations. This particular focus is especially appropriate for students with undergraduate preparation in business administration, commerce, economics, or marketing who have career interests in research and analysis in marketing management. The program also provides excellent training toward the pursuit of a PhD in marketing or consumer behaviour or a related business discipline.

### Admission Requirements

Admission information should be requested directly from the graduate program assistant in the Department of Marketing and Consumer Studies. Offers of admission are granted on a competitive basis and, in part, on the ability of graduate faculty to supervise the student's intended research. Potential applicants are urged to visit the department to discuss their research objectives with graduate faculty prior to applying. Visits should be arranged directly with members of graduate faculty. Please visit our departmental website <http://www.uoguelph.ca/mcs> for graduate faculty phone numbers and e-mail addresses.

All applicants should have completed a minimum of one course in statistics as part of their undergraduate program. Applicants are also encouraged to have completed courses in areas such as marketing, consumer behaviour, marketing research, and related subjects. Students may be admitted to the graduate program despite deficiencies in certain academic areas. Students admitted with deficiencies will likely be required to address academic weaknesses by enrolling in one or more undergraduate courses at the University of Guelph. Undergraduate courses do not count toward fulfillment of master of science graduation requirements.

All applicants are required to submit GRE or GMAT scores. The Department of Marketing and Consumer Studies admits students to the graduate program only in September. Program offices should be consulted for admission deadlines.

### Degree Requirements

The program normally consists of at least 6 half credit (3.0 full credits) graduate courses, enrolment in the marketing and consumer studies seminar (MCS\*6950) for each semester of full-time graduate study, and a successfully defended thesis. Additional course credits may be required by the student's advisory committee depending upon the student's background preparation for his/her intended area of study and thesis research.

### Departmental Core Courses

The departmental core is required of all graduate students in the Department of Marketing and Consumer Studies. It contains a minimum of 6 half credits (3.0 full credits) in total, and enrolment in the marketing and consumer studies department seminar (MCS\*6950) for each semester of full-time graduate study. The program consists of:

#### Fall Semester:

MCS*6000	[0.50]	Consumption Behaviour Theory I
MCS*6050	[0.50]	Research Methods in Marketing and Consumer Studies
MCS*6100	[0.50]	Marketing Theory
MCS*6950	[0.00]	Marketing & Consumer Studies Seminar

#### Winter Semester:

MCS*6060	[0.50]	Multivariate Research Methods
MCS*6080	[0.50]	Qualitative Research Methods
MCS*6950	[0.00]	Marketing & Consumer Studies Seminar

\* 1 of the following restricted electives

#### Electives

MCS*6010	[0.50]	Consumption Behaviour Theory II
MCS*6120	[0.50]	Marketing Management

#### Note

\*Chosen by the graduate student with the approval of the Graduate Program Coordinator and his/her advisory committee. Any Social Science Graduate level course may be substituted for the Elective.

#### Note

MCS\*6950 is taken during each semester of full-time graduate study until graduation

### Graduate Diploma in Market Research

The Graduate Diploma in Market Research serves the needs of students who want to extend their knowledge of market research beyond the level they obtained while taking their undergraduate degree, but do not want to undertake a thesis-based degree.

### Admission Requirements

Students who wish to enter the Graduate Diploma in Market Research program will apply to the Department's Graduate Admissions Committee through the normal University application process.

Candidates will be graduates of a four-year honours degree program (or equivalent) who maintained at least a B average in the final two years of their undergraduate program. They will have an academic background in consumer studies, the social sciences or humanities, or professional or business programs such as marketing, finance, or real estate, and they will submit a discussion paper indicating why they are interested in the Market Research field.

The Graduate Program Coordinator will also act as the primary advisor for Diploma students.

## Degree Requirements

Students are required to take courses in the Fall and Winter semesters. Students will complete a minimum of 6 half credits (3.0 full credits) in total, and enrolment in the marketing and consumer studies department seminar (MCS\*6950) each semester. The program consists of:

### Fall Semester:

MCS*6000	[0.50]	Consumption Behaviour Theory I
MCS*6050	[0.50]	Research Methods in Marketing and Consumer Studies
MCS*6100	[0.50]	Marketing Theory
MCS*6950	[0.00]	Marketing & Consumer Studies Seminar

### Winter Semester:

MCS*6060	[0.50]	Multivariate Research Methods
MCS*6080	[0.50]	Qualitative Research Methods
MCS*6950	[0.00]	Marketing & Consumer Studies Seminar

\* one of the following restricted electives

MCS*6010	[0.50]	Consumption Behaviour Theory II
MCS*6120	[0.50]	Marketing Management
MCS*6200	[0.50]	Marketing Analytics

## Courses

For courses without a semester designation the student should consult the Graduate Program Coordinator.

### MCS\*6000 Consumption Behaviour Theory I F [0.50]

A review of the nature and scope of consumption behaviour and the approaches to studying the role of human consumption using the major theoretical perspectives.

*Department(s):* Department of Marketing and Consumer Studies

### MCS\*6010 Consumption Behaviour Theory II W [0.50]

Consumption behaviour is an interdisciplinary field of study which applies theories from multiple disciplines to the activities and processes people engage in when choosing, using and disposing of goods and services. The purpose of this course is to provide a basic review of the theoretical foundations of aspects of consumption and consumer behaviour and to demonstrate their applicability to marketing management. The course is designed to allow participants to bring their own background and interests to bear on the review and application of the theories underlying consumer behaviour.

*Prerequisite(s):* MCS\*6000 or consent of instructor

*Department(s):* Department of Marketing and Consumer Studies

### MCS\*6050 Research Methods in Marketing and Consumer Studies F [0.50]

A comprehensive review of measurement theory, including issues such as construct definition, scale development, validity and reliability. Applicants of measurement principles will be demonstrated, particularly as they relate to experimental and survey research design.

*Department(s):* Department of Marketing and Consumer Studies

### MCS\*6060 Multivariate Research Methods W [0.50]

A review of selected multivariate analysis techniques as applied to marketing and consumer research. Topics include regression, anova, principal components, factor and discriminant analysis, nonmetric scaling and trade-off analysis. The course uses a hands-on approach with small sample databases available for required computer-program analysis.

*Prerequisite(s):* MCS\*6050 or consent of instructor

*Department(s):* Department of Marketing and Consumer Studies

### MCS\*6070 Introduction to Structural Equation Modeling W [0.50]

This course introduces students to the theory, concepts and application of structural equation modeling. Topics covered include path analysis, confirmatory factor analysis and measurement models, latent variable modeling, multi-group modeling, and measurement invariance testing. Emphasis is placed on applying the principles of SEM to the creation and testing of theoretically driven models using both categorical and continuous data.

*Department(s):* Department of Marketing and Consumer Studies

### MCS\*6080 Qualitative Research Methods W [0.50]

A review of the nature, importance and validity issues associated with qualitative research. Topics include theory and tactics in design, interpersonal dynamics, analysis of interaction and transcripts.

*Prerequisite(s):* MCS\*6050 or consent of instructor

*Department(s):* Department of Marketing and Consumer Studies

### MCS\*6090 Special Topics in Consumer Research and Analysis U [0.50]

*Department(s):* Department of Marketing and Consumer Studies

### MCS\*6100 Marketing Theory F [0.50]

A theoretical understanding of marketing, including philosophy of science and marketing, a history of marketing thought, market orientation, marketing strategy theory, modeling, social marketing, and ethical issues in marketing.

*Restriction(s):* Signature required for non-MCS students.

*Department(s):* Department of Marketing and Consumer Studies

### MCS\*6120 Marketing Management U [0.50]

This course is designed to increase depth of knowledge of marketing by helping the student understand how marketing theory can directly affect marketing practice and firm performance. As this is an MSc course and NOT an MBA course, there is an expectation that the level of critical thinking and knowledge growth falls within the realm of the science of marketing and/or the empirical nature of marketing research and is not simply about marketing practice.

*Prerequisite(s):* MCS\*6100

*Department(s):* Department of Marketing and Consumer Studies

### MCS\*6200 Marketing Analytics F [0.50]

Course will cover major marketing decisions and the analytical tools to make decisions for business solutions. Topics and tools include market segmentation, targeting and positioning, new product design and forecasting, marketing mix and resource allocation and customer life time value.

*Restriction(s):* Restricted to MSc.MCS, MSc.TRMH, MA.MGMT, PhD.MGMT students

*Department(s):* Department of Marketing and Consumer Studies

### MCS\*6260 Special Topics in Food Marketing U [0.50]

*Department(s):* Department of Marketing and Consumer Studies

### MCS\*6500 Global Business Today U [0.50]

This course will survey the key issues related to doing business internationally including the cultural context for global business, cross border trade and investment, ethics, the global monetary system, foreign exchange challenges and effectively competing in the global environment.

*Restriction(s):* Non MBA/MA Leadership students only by permission of Executive Programs Office.

*Department(s):* Executive Programs

### MCS\*6710 Special Topics in Marketing U [0.50]

*Department(s):* Department of Marketing and Consumer Studies

### MCS\*6720 Special Topics in Housing and Real Estate U [0.50]

*Department(s):* Department of Marketing and Consumer Studies

### MCS\*6950 Marketing & Consumer Studies Seminar F,W [0.00]

*Department(s):* Department of Marketing and Consumer Studies

## Mathematics and Statistics

The objective of the graduate program is to offer opportunities for advanced studies and research in the fields of:

- Applied Mathematics
- Applied Statistics

Although the two fields within the program have different requirements in terms of specific courses and qualifying examination areas, there is a considerable degree of interaction and commonality between them, from both philosophical and practical viewpoints. Philosophically, this commonality relates to the methodology of constructing and validating models of specific real-world situations. The major areas of specialization in applied mathematics are dynamical systems, mathematical biology, numerical analysis and operations research. Applied statistics encompasses the study and application of statistical procedures to data arising from real-world problems. Much of the emphasis in this field concerns problems originally arising in a biological setting. The major areas of specialization include linear and nonlinear models; bioassay; and survival analysis, life testing and reliability.

### Administrative Staff

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### Graduate Faculty

#### R. Ayesha Ali

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#### Daniel A. Ashlock

BSc Kansas, PhD California Institute of Technology - Professor

#### Jeremy Balka

BSc, MSc, PhD Guelph - Assistant Professor

#### Edward M. Carter

BSc, MSc, PhD Toronto - Professor

#### Monica Cojocaru

BA, MSc Bucharest, PhD Queen's - Associate Professor

#### Gerarda Darlington

BSc, MSc Guelph, PhD Waterloo - Professor

#### Lorna Deeth

BSc, MSc, PhD Guelph - Assistant Professor

#### Matthew Demers

BSc, MSc, PhD Guelph - Assistant Professor

#### Anthony F. Desmond

BSc, MSc National University of Ireland (U.C.C.), PhD Waterloo - Professor

#### Hermann J. Eberl

Dipl. Math (MSc), PhD Munich Univ. of Tech. - Professor and Canada Research Chair

#### Zeny Feng

BSc York, MA, PhD Waterloo - Associate Professor

#### Marcus R. Garvie

MS Sussex, MS Wales, MS Reading, PhD Durham - Associate Professor

#### Stephen Gismond

BSc, MSc, PhD Guelph - Associate Professor

#### Julie Horrocks

BSc Mount Allison, BFA Nova Scotia College of Art & Design, MMath, PhD Waterloo - Professor and Chair

#### Peter T. Kim

BA Toronto, MA Southern California, PhD California (San Diego) - Professor

#### David Kribs

BSc Western, MMath, PhD Waterloo - Professor and University Research Chair

#### Herb Kunze

BA, MA, PhD Waterloo - Professor

#### Anna T. Lawniczak

MSc Wroclaw, PhD Southern Illinois - Professor

#### Kim Levere

BA, PhD Guelph - Assistant Professor

#### Rajesh Pereira

BSc,MSc McGill, PhD Toronto - Associate Professor

#### Gary J. Umphrey

BSc, MSc Guelph, PhD Carleton - Associate Professor

#### Allan Willms

BMath, MMath Waterloo, PhD Cornell - Associate Professor

#### Bei Zeng

BSc, MSc Tsinghua, PhD M.I.T. - Associate Professor

### Associated Graduate Faculty

#### Christopher Bauch

BS Texas, MASt Cambridge, PhD Warwick - Professor, Mathematics, University of Waterloo

#### Sanjeena Dang

BSc, MSc, PhD Guelph - Assistant Professor, Binghamton University, New York

#### Robert Deardon

BSc Exeter, MSc Southampton, PhD Reading - Associate Professor, University of Calgary

#### Stephanie Dixon

BSc McMaster, MSc, PhD Guelph - Adjunct Faculty at University of Western Ontario, London Health Sciences Centre

#### John Holbrook

BSc, MSc Queen's, PhD Caltech - Professor Emeritus, Mathematics and Statistics, University of Guelph

#### William Langford

BSc Queens, PhD Caltech - University Professor Emeritus, Mathematics and Statistics, University of Guelph

#### William Smith

BASc, MASc Toronto, MSc PhD Waterloo - University Professor Emeritus, Mathematics and Statistics, University of Guelph

#### Edward Thommes

BSc Alberta, PhD Queens - Adjunct Professor, Mathematics and Statistics, University of Guelph/Health Outcome Manager, GlaxoSmithKline Canada

### MSc Program

The department offers an MSc degree in the fields of : 1) mathematics; or 2) statistics.

### Admission Requirements

For the MSc Degree Program, applicants will normally have either

- i) an honours degree with an equivalent to a major in the intended area of emphasis.
- or
- ii) an honours degree with the equivalent of a minor in the intended area of emphasis, as defined in the University of Guelph Undergraduate Calendar.

Strong applicants with more diverse backgrounds will also be considered but are encouraged to contact the Graduate Program Coordinator or a potential advisor before applying.

Note that the department's undergraduate diploma in applied statistics fulfils the requirement of a minor equivalent in statistics.

### Degree Requirements

Students enrol in one of two study options: 1) thesis, or 2) course work and major research project.

All programs of study must include the appropriate core courses (see below). Students who have obtained prior credit for a core course or its equivalent will normally substitute a departmental graduate course at the same or higher level, with the approval of the Graduate Program Coordinator. The remaining prescribed courses are to be selected from either graduate courses or 400-level undergraduate courses. Courses taken outside of this department must have the prior approval of the Graduate Program Committee.

#### Thesis

Students must complete at least 2.0 credits (four courses) plus a thesis.

#### Course Work and Major Research Project (MRP)

Students must complete at least 3.0 credits (six courses), 2.0 of which must be for graduate-level courses plus successful completion, within two semesters either MATH\*6998 MSc Project in Mathematics or STAT\*6998 MSc Project in Statistics.

### Mathematical Area of Emphasis

All candidates for the MSc with a mathematical area of emphasis are required to include in their program of study at least two of the core courses. The core courses are:

MATH*6010	[0.50]	Analysis
MATH*6020	[0.50]	Scientific Computing
MATH*6051	[0.50]	Mathematical Modelling

For an MSc by thesis at least three MATH courses must be taken, for an MSc by course work and major research project at least four MATH courses must be taken.

### Statistical Area of Emphasis

All candidates for the MSc with a statistical area of emphasis are required to include in their program of study at least two of the core courses.

The core courses are:

STAT*6801	[0.50]	Statistical Learning
STAT*6802	[0.50]	Generalized Linear Models and Extensions

STAT\*6841 [0.50] Computational Statistical Inference

It is required that students take the undergraduate course Statistical Inference, STAT\*4340, if this course or its equivalent has not previously been taken. For an MSc by thesis at least three STAT courses must be taken, for an MSc by course work and major research project at least four STAT courses must be taken.

## PhD Program

### Admission Requirements

Normally a candidate for the PhD degree program must possess a recognized master's degree obtained with high academic standing. The Departmental Graduate Program Committee will consider applications for direct entry to PhD and for transfer from MSc to PhD. In any event, a member of the department's graduate faculty must agree to act as an advisor to the student.

### Degree Requirements

The PhD degree is primarily a research degree. For that reason, course work commonly comprises a smaller proportion of the student's effort than in the master's program. Course requirements are as follows:

#### Applied Mathematics

Students must successfully complete 2.0 graduate course credits; i.e. four graduate courses. At least three of these courses must be graduate level MATH courses. Depending upon the student's academic background, further courses may be prescribed. All courses are chosen in consultation with the advisory committee. Additional courses may be required at the discretion of the advisory committee and/or the departmental Graduate Program Committee. With departmental approval, some courses given by other universities may be taken for credit. Courses taken outside of this department must have the prior approval of the Graduate Program Committee.

#### Applied Statistics

Students must successfully complete 2.0 graduate-course credits. At least three of these courses must be graduate level STAT courses. Depending upon the student's academic background, further courses may be prescribed. Students must take the following courses as part of the four required courses (providing that these courses were not taken as part of the student's master's-degree program):

STAT\*6801 [0.50] Statistical Learning

STAT\*6841 [0.50] Computational Statistical Inference

All courses are chosen in consultation with the student's advisory committee. Additional courses may be required at the discretion of the advisory committee and/or the departmental Graduate Program Committee. With departmental approval, some courses given by other universities may be taken for credit. Courses taken outside of this department must have the prior approval of the Graduate Program Committee.

## Interdepartmental Programs

### Biophysics MSc/PhD Program

The Department of Mathematics and Statistics participates in the MSc/PhD programs in biophysics. Please consult the Biophysics listing for a detailed description of the graduate programs offered by the Biophysics Interdepartmental Group.

### Bioinformatics MBNF/MSc/PhD Programs

The Department of Mathematics and Statistics participates in the MBNF/MSc/PhD programs in Bioinformatics. Please consult the Bioinformatics listing for a detailed description of these graduate programs and a list of the graduate faculty involved.

## Courses

### Mathematics

#### MATH\*6010 Analysis U [0.50]

Half the course covers metric spaces, normed linear spaces, and inner product spaces, including Banach's and Schauder's fixed point theorems,  $L_p$  spaces, Hilbert spaces and the projection theorem. The remaining content may include topics like operator theory, inverse problems, measure theory and spectral analysis.

*Department(s):* Department of Mathematics and Statistics

#### MATH\*6011 Dynamical Systems I U [0.50]

Basic theorems on existence, uniqueness and differentiability; phase space, flows, dynamical systems; review of linear systems, Floquet theory; Hopf bifurcation; perturbation theory and structural stability; differential equations on manifolds. Applications drawn from the biological, physical, and social sciences.

*Department(s):* Department of Mathematics and Statistics

#### MATH\*6012 Dynamical Systems II U [0.50]

The quantitative theory of dynamical systems defined by differential equations and discrete maps, including: generic properties; bifurcation theory; the center manifold theorem; nonlinear oscillations, phase locking and period doubling; the Birkhoff-Smale homoclinic theorem; strange attractors and deterministic chaos.

*Department(s):* Department of Mathematics and Statistics

#### MATH\*6020 Scientific Computing U [0.50]

This course covers the fundamentals of algorithms and computer programming. This may include computer arithmetic, complexity, error analysis, linear and nonlinear equations, least squares, interpolation, numerical differentiation and integration, optimization, random number generators, Monte Carlo simulation; case studies will be undertaken using modern software.

*Department(s):* Department of Mathematics and Statistics

#### MATH\*6021 Optimization I U [0.50]

A study of the basic concepts in: linear programming, convex programming, non-convex programming, geometric programming and related numerical methods.

*Department(s):* Department of Mathematics and Statistics

#### MATH\*6022 Optimization II U [0.50]

A study of the basic concepts in: calculus of variations, optimal control theory, dynamic programming and related numerical methods.

*Department(s):* Department of Mathematics and Statistics

#### MATH\*6031 Functional Analysis U [0.50]

Hilbert, Banach and metric spaces are covered including applications. The Baire Category theorem is covered along with its consequences such as the open mapping theorem, the principle of uniform boundedness and the closed graph theorem. The theory of linear functionals is discussed including the Hahn-Banach theorem, dual spaces, and if time permits, weak topologies or generalized functions. Basic operator theory is covered including topics such as adjoints, compact operators, the Frechet derivative and spectral theory. A brief introduction to the concepts of measure and integration required for some of the aforementioned topics is also included. Offered in conjunction with MATH\*4220. Extra work is required of graduate students.

*Restriction(s):* Credit may be obtained for only one of MATH\*4220 or MATH\*6031

*Department(s):* Department of Mathematics and Statistics

#### MATH\*6041 Partial Differential Equations I U [0.50]

Classification of partial differential equations. The Hyperbolic type, the Cauchy problem, range of influence, well- and ill-posed problems, successive approximation, the Riemann function. The elliptic type: fundamental solutions, Dirichlet and Neumann problems. The parabolic type: boundary conditions, Green's functions and separation of variables. Introduction to certain non-linear equations and transformations methods. Offered in conjunction with MATH\*4270. Extra work is required for graduate students.

*Restriction(s):* Credit may be obtained for only one of MATH\*4270 or MATH\*6041

*Department(s):* Department of Mathematics and Statistics

#### MATH\*6042 Partial Differential Equations II U [0.50]

A continuation of some of the topics of Partial Differential Equations I. Also, systems of partial differential equations, equations of mixed type and non-linear equations.

*Department(s):* Department of Mathematics and Statistics

#### MATH\*6051 Mathematical Modelling U [0.50]

The process of phenomena and systems model development, techniques of model analysis, model verification, and interpretation of results are presented. The examples of continuous or discrete, deterministic or probabilistic models may include differential equations, difference equations, cellular automata, agent based models, network models, stochastic processes.

*Department(s):* Department of Mathematics and Statistics

#### MATH\*6071 Biomathematics U [0.50]

The application of mathematics to model and analyze biological systems. Specific models to illustrate the different mathematical approaches employed when considering different levels of biological function.

*Department(s):* Department of Mathematics and Statistics

#### MATH\*6091 Topics in Analysis U [0.50]

Selected topics from topology, real analysis, complex analysis, and functional analysis.

*Department(s):* Department of Mathematics and Statistics

#### MATH\*6181 Topics in Applied Mathematics I U [0.50]

This course provides graduate students, either individually or in groups, with the opportunity to pursue topics in applied mathematics under the guidance of graduate faculty. Course topics will normally be advertised by faculty in the semester prior to their offering. Courses may be offered in any of lecture, reading/seminar, or individual project formats.

*Department(s):* Department of Mathematics and Statistics

**MATH\*6182 Topics in Applied Mathematics II U [0.50]**

This course provides graduate students, either individually or in groups, with the opportunity to pursue topics in applied mathematics under the guidance of graduate faculty. Course topics will normally be advertised by faculty in the semester prior to their offering. Courses may be offered in any of lecture, reading/seminar, or individual project formats.

*Department(s):* Department of Mathematics and Statistics

**MATH\*6400 Numerical Analysis I U [0.50]**

Topics selected from numerical problems in: matrix operations, interpolation, approximation theory, quadrature, ordinary differential equations, partial differential equations, integral equations, nonlinear algebraic and transcendental equations.

*Department(s):* Department of Mathematics and Statistics

**MATH\*6410 Numerical Analysis II U [0.50]**

One or more topics selected from those discussed in Numerical Analysis I, but in greater depth.

*Department(s):* Department of Mathematics and Statistics

**MATH\*6990 Mathematics Seminar U [0.00]**

Students will review mathematical literature and present a published paper.

*Department(s):* Department of Mathematics and Statistics

**MATH\*6998 MSc Project in Mathematics U [1.00]**

This course is intended for students in the course-based MSc program in Mathematics. The MSc project will be written under the supervision of a faculty member and will normally be completed within one or two semesters. Once completed, students will submit a final copy of their project to the Department and give an oral presentation of their work.

*Restriction(s):* Restricted to MSC.MAST:L-MATH students in Mathematics

*Department(s):* Department of Mathematics and Statistics

**Statistics****STAT\*6550 Computational Statistics U [0.50]**

This course covers the implementation of a variety of computational statistics techniques. These include random number generation, Monte Carlo methods, non-parametric techniques, Markov chain Monte Carlo methods, and the EM algorithm. A significant component of this course is the implementation of techniques.

*Department(s):* Department of Mathematics and Statistics

**STAT\*6700 Stochastic Processes U [0.50]**

The content of this course is to introduce Brownian motion leading to the development of stochastic integrals thus providing a stochastic calculus. The content of this course will be delivered using concepts from measure theory and so familiarity with measures, measurable spaces, etc., will be assumed.

*Department(s):* Department of Mathematics and Statistics

**STAT\*6721 Stochastic Modelling U [0.50]**

Topics include the Poisson process, renewal theory, Markov chains, Martingales, random walks, Brownian motion and other Markov processes. Methods will be applied to a variety of subject matter areas. Offered in conjunction with STAT\*4360. Extra work is required for graduate students.

*Restriction(s):* Credit may be obtained for only one of STAT\*4360 or STAT\*6721

*Department(s):* Department of Mathematics and Statistics

**STAT\*6741 Statistical Analysis for Reliability and Life Testing U [0.50]**

Statistical failure models, order statistics, point and interval estimation procedures for life time distributions, testing reliability hypotheses, Bayes methods in reliability, system reliability.

*Department(s):* Department of Mathematics and Statistics

**STAT\*6761 Survival Analysis U [0.50]**

Kaplan-Meier estimation, life-table methods, the analysis of censored data, survival and hazard functions, a comparison of parametric and semi-parametric methods, longitudinal data analysis.

*Department(s):* Department of Mathematics and Statistics

**STAT\*6801 Statistical Learning U [0.50]**

Topics include: nonparametric and semiparametric regression; kernel methods; regression splines; local polynomial models; generalized additive models; classification and regression trees; neural networks. This course deals with both the methodology and its application with appropriate software. Areas of application include biology, economics, engineering and medicine.

*Department(s):* Department of Mathematics and Statistics

**STAT\*6802 Generalized Linear Models and Extensions U [0.50]**

Topics include: generalized linear models; generalized linear mixed models; joint modelling of mean and dispersion; generalized estimating equations; modelling longitudinal categorical data; modelling clustered data. This course will focus both on theory and implementation using relevant statistical software. Offered in conjunction with STAT\*4050/4060. Extra work is required for graduate students.

*Restriction(s):* Credit may be obtained for only one of STAT\*4050 or STAT\*4060 or STAT\*6802

*Department(s):* Department of Mathematics and Statistics

**STAT\*6821 Multivariate Analysis U [0.50]**

This is an advanced course in multivariate analysis and one of the primary emphases will be on the derivation of some of the fundamental classical results of multivariate analysis. In addition, topics that are more current to the field will also be discussed such as: multivariate adaptive regression splines; projection pursuit regression; and wavelets. Offered in conjunction with STAT\*4350. Extra work is required for graduate students.

*Restriction(s):* Credit may be obtained for only one of STAT\*4350 or STAT\*6821

*Department(s):* Department of Mathematics and Statistics

**STAT\*6841 Computational Statistical Inference U [0.50]**

This course covers Bayesian and likelihood methods, large sample theory, nuisance parameters, profile, conditional and marginal likelihoods, EM algorithms and other optimization methods, estimating functions, Monte Carlo methods for exploring posterior distributions and likelihoods, data augmentation, importance sampling and MCMC methods.

*Department(s):* Department of Mathematics and Statistics

**STAT\*6850 Advanced Biometry U [0.50]**

Topics on advanced techniques for analyzing data from biological systems. In particular, univariate discrete models, stochastic processes as it relates to population dynamics and growth models with time dependencies, generalized discrete models for spatial patterns in wildlife, the theoretical foundation and recent results in aquatic bioassays, and other topics relating to the student's research interest.

*Department(s):* Department of Mathematics and Statistics

**STAT\*6860 Linear Statistical Models U [0.50]**

Generalized inverses of matrices; distribution of quadratic and linear forms; regression or full rank model; models not of full rank; hypothesis testing and estimation for full and non-full rank cases; estimability and testability; reduction sums of squares; balanced and unbalanced data; mixed models; components of variance.

*Department(s):* Department of Mathematics and Statistics

**STAT\*6870 Experimental Design U [0.50]**

This is an advanced course in experimental design which emphasizes proofs of some of the fundamental results in the topic. The topics will include: design principles; design linear models; designs with several factors; confounding in symmetrical factorials; fractional factorials.

*Department(s):* Department of Mathematics and Statistics

**STAT\*6880 Sampling Theory U [0.50]**

Theory of equal and unequal probability sampling. Topics in: simple random, systematic, and stratified sampling; ratio and regression estimates; cluster sampling and subsampling; double sampling procedure and repetitive surveys; nonsampling errors.

*Department(s):* Department of Mathematics and Statistics

**STAT\*6920 Topics in Statistics U [0.50]**

*Department(s):* Department of Mathematics and Statistics

**STAT\*6950 Statistical Methods for the Life Sciences F [0.50]**

Analysis of variance, completely randomized, randomized complete block and latin square designs; planned and unplanned treatment comparisons; random and fixed effects; factorial treatment arrangements; simple and multiple linear regression; analysis of covariance with emphasis on the life sciences. STAT\*6950 and STAT\*6960 are intended for graduate students of other departments and may not normally be taken for credit by mathematics and statistics graduate students.

*Department(s):* Department of Mathematics and Statistics

**STAT\*6970 Statistical Consulting Internship U [0.25]**

This course provides experience in statistical consulting in a laboratory and seminar environment. The student will participate in providing statistical advice and/or statistical analyses and participate in seminar discussions of problems arising from research projects in various disciplines.

*Department(s):* Department of Mathematics and Statistics

**STAT\*6990 Statistics Seminars by Graduate Students U [0.00]**

*Department(s):* Department of Mathematics and Statistics

**STAT\*6998 MSc Project in Statistics U [1.00]**

This course is intended for students in the course-based MSc program in Statistics. The MSc project will be written under the supervision of a faculty member and will normally be completed within one or two semesters. Once completed, students will submit a final copy of their project to the Department and give an oral presentation of their work

*Restriction(s):* Restricted to MSC.MAST:L-STAT students in Statistics

*Department(s):* Department of Mathematics and Statistics

## Molecular and Cellular Biology

The MCB graduate program offers opportunities for interdisciplinary studies in molecular and cellular biology leading to the MSc and PhD degrees in the following five fields:

- **Biochemistry**
- **Cell Biology**
- **Microbiology**
- **Molecular Biology and Genetics**
- **Plant Biology**

The research groups directed by the faculty pursue fundamental and applied research questions involving diverse biological systems (plants, humans and other animals, prokaryotic and eukaryotic microbes). In general, they follow lines of scientific enquiry at the level of molecules to cells. See the [department website](#) for additional information.

### Administrative Staff

#### Chair

Marc Coppolino (4477 Science Complex, Ext. 53031)  
mcoppoli@uoguelph.ca

#### Graduate Program Coordinator

Andrew Bendall (3459 Science Complex, Ext. 53491)  
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#### Graduate Program Assistant

Bertilla Moroni (4480 Science Complex, Ext. 56246)  
cbismcbgrad@uoguelph.ca

#### CBS Graduate Admissions Secretary

Karen White (3479 Science Complex, Ext. 52730)  
cbsgrad@uoguelph.ca

### Graduate Faculty

#### Tariq Akhtar

BSc, MSc Waterloo, PhD Florida - Assistant Professor

#### Emma Allen-Vercoe

BSc London UK, PhD Open UK - Professor

#### Mark D. Baker

BSc Laurentian, MSc, PhD Waterloo - Professor

#### Andrew J. Bendall

BSc Australian National, PhD Macquarie - Associate Professor and Graduate Program Coordinator

#### Manfred Brauer

BSc Calgary, MSc, PhD Wisconsin - Associate Professor

#### Malcolm Campbell

BSc Guelph, MA Oxford, PhD Guelph - Professor and Vice-President (Research)

#### Anthony J. Clarke

BSc, MSc, PhD Waterloo - Professor

#### Joseph L. Colasanti

BSc, PhD Western Ontario - Associate Professor

#### Marc Coppolino

BSc Waterloo, MSc, PhD Toronto - Associate Professor and Chair

#### Georgina Cox

BSc, PhD Leeds - Assistant Professor

#### John Dawson

BSc Wilfrid Laurier, PhD Alberta - Professor

#### Michael J. Emes

BSc, PhD Sheffield - Professor

#### Steffen P. Graether

BSc, MSc, PhD Queen's - Associate Professor

#### George Harauz

BASc, MSc, PhD Toronto - Professor

#### Nina Jones

BSc Guelph, PhD Toronto - Associate Professor

#### David Josephy

BSc Toronto, PhD British Columbia - Professor

#### Azad Kaushik

BVSc, MVSc Haryana, DSc Inst. Pasteur - Associate Professor

#### Cezar Khursigara

BSc Ryerson, PhD McGill - Associate Professor

#### Matthew S. Kimber

BSc, PhD Toronto - Associate Professor

#### Jasmin Lalonde

BA Ottawa, MA, PhD McGill - Assistant Professor

#### Ray Lu

BSc Wuhan (China), MSc Beijing Medical, PhD Saskatchewan - Associate Professor

#### Jaideep Mathur

BSc, MSc Lucknow (India), PhD Gorakhpur (India) - Associate Professor

#### Baozhong Meng

BSc, MSc Hebei Agricultural Univ. (China) - Associate Professor

#### Rod Merrill

BSc Lethbridge, PhD Ottawa - Professor

#### Richard D. Mosser

BSc, PhD Waterloo - Associate Professor

#### Robert T. Mullen

BSc, PhD Alberta - Professor

#### Lucy M. Mutharia

BSc, MSc Nairobi, PhD British Columbia - Associate Professor

#### Annette Nassuth

BSc, MSc Free University, Amsterdam, PhD Leiden - Associate Professor

#### Melissa Perreault

BSc, MSc, Ph.D, McMaster University - Assistant Professor

#### Steven Rothstein

BA Swarthmore College, PhD Wisconsin - Professor

#### Scott Ryan

BSc Memorial, PhD Ottawa - Assistant Professor

#### Stephen Y.K. Seah

BSc, MSc National University of Singapore, PhD Sheffield - Associate Professor

#### Ian Tetlow

BSc Newcastle (UK), PhD North Wales - Associate Professor

#### James Uniacke

BSc, PhD Concordia University - Assistant Professor

#### George van der Merwe

BSc, MSc, PhD Stellenbosch (South Africa) - Associate Professor

#### Terry Van Raay

BSc Windsor, MSc Guelph, PhD Utah - Associate Professor

#### John Vessey

BSc, MSc Dalhousie, PhD Eberhard Karls University of Tübingen - Assistant Professor

#### Christopher Whitfield

BSc Newcastle, PhD Edinburgh - Professor

#### Krassimir (Joseph) Yankulov

BSc Sophia, PhD ICRF London - Professor

### Associated Graduate Faculty

#### Marc Aucoin

BASc, MSc Waterloo, PhD Montreal - Associate Professor, Chemistry, University of Waterloo

#### Peter J. Krell

BSc, MSc Carleton, PhD Dalhousie - Professor, Molecular and Cellular Biology, University of Guelph

#### Joseph S.L. Lam

BSc, PhD Calgary - Professor

#### Reggie Y.C. Lo

BSc, PhD Alberta - Professor Emeritus, Molecular and Cellular Biology, University of Guelph

#### Ross N. Nazar

BSc, PhD Toronto - Professor Emeritus, Molecular and Cellular Biology, University of Guelph

#### E. Jane Robb

BSc York, PhD British Columbia - Professor Emerita, Molecular and Cellular Biology, University of Guelph

#### Frances Sharom

BSc Guelph, PhD Western Ontario - Professor Emerita, Molecular and Cellular Biology, University of Guelph

#### Roselynn M.W. Stevenson

BSc, PhD Manitoba - Professor Emerita, Molecular and Cellular Biology, University of Guelph

#### Janet M. Wood

BSc Victoria, PhD Edinburgh - Professor

## MSc Program

The MCB MSc program is offered in five fields: 1) biochemistry; 2) cell biology; 3) microbiology; 4) molecular biology and genetics; and 5) plant biology. The objective of the program is to provide graduate students with a high level of relevant knowledge and expertise in contemporary molecular and cellular biology, including experimental techniques, library research, writing and communication skills. Graduates will have the knowledge and skills needed to carry out high quality scientific research and will be prepared for employment in positions with some responsibility in the research and teaching enterprises of academic institutions (as instructors and technical staff), in science-related positions in the broad biotechnology sector (e.g. food and beverage industries, pharmaceuticals, biomedical, and agriculture-related industries), or in government sector institutes and laboratories. They will be well prepared to continue their graduate education at the PhD level. Alternatively they may opt to complete a professional degree (such as law, medicine, or business) or a teaching certificate.

### Admission Requirements

To be considered, applicants must have completed a four-year honours undergraduate science degree (or its equivalent) in a relevant discipline. Normally, the applicant must have achieved a "B" (75%) average or higher during the last two years of full-time study. In exceptional circumstances, students with a "B-minus" average (70%) will be considered provided there is strong supporting evidence of research aptitude and potential.

Each applicant must obtain the support of a faculty member willing to serve as his/her thesis advisor.

Admission may be granted for entry in September, January or May. Completed applications should be uploaded at least one full semester (four months) before the expected date of admission (at least eight months for international students).

All components of the application, including transcript(s), graduate certificate(s), grading scale(s), language test results, assessment forms, a statement of interest, and the name of the faculty advisor must be uploaded no later than two months after an application is submitted through the OUAC portal. Applications that are incomplete after this time period will be closed.

### Admission Process

Graduate student applications to programs in the College of Biological Science are handled by the Office of the Associate Dean, Research (ADR). Before submitting an application, applicants are strongly encouraged to view the "[Before you Apply](#)" and "[Admission Process](#)" webpages on the ADR Future Student's site.

Complete application instructions may also be found on the [Office of Graduate Studies](#) webpage or in the Graduate Calendar

### Degree Requirements

Students in the MSc program must complete a minimum of 2 courses (1.5 credits) at the graduate level. The course MCB\*6500 MSc Research Topics in Molecular & Cellular Biology (1.0) is mandatory. This two-semester should be completed in the first year of study and normally in the first two semesters. Senior undergraduate courses may be taken on the recommendation of the Advisory Committee but these will not count towards the 1.5 credit requirement. An average of "B-minus" (70%) must be achieved in the prescribed courses.

The MSc thesis research must involve original enquiry into a well-defined question in the molecular biosciences. It is expected that the research will not have been previously reported in the literature and, wherever possible, the research should yield publishable data.

All students beyond year 1 in the program are required to participate annually in the CBS Graduate Student Symposium by presenting a poster or giving a short talk describing their research progress.

## PhD Program

The MCB PhD program is offered in five fields: 1) biochemistry; 2) cell biology; 3) microbiology; 4) molecular biology and genetics; and 5) plant biology. The objective of the program is to develop independent and creative scientists specializing in molecular and cellular biology. Graduates will be prepared for positions as scholars in academic institutions, as leaders in the research and development sector of the biomedical and other industries or government agencies, and in social institutions.

### Admission Requirements

There are three pathways for admission to the PhD program:

1. Students who have achieved an "A-minus" (80%) average or higher during the last two years of full-time study while completing a four-year honours BSc program (or its equivalent) and who provide evidence of research aptitude and potential based on laboratory research experience may apply to enter the PhD program directly, or

2. An MSc student may apply to transfer to the PhD program before completing the MSc degree. To be eligible for transfer, the student must have completed a high quality undergraduate degree with a grade average of B+ or higher. Before applying for transfer to the PhD program students must complete MCB\*6500 (MSc Research Topics in Molecular and Cellular Biology) plus an additional course with at least 0.5 graduate course credit, attaining an overall A minus average (at least 80%). Applications for transfer must be approved by the end of the fourth semester in the MSc program.
3. Applicants may have completed a recognized Masters degree in a relevant discipline with a minimum academic standing of "A-minus" (80%).

Each applicant must obtain the support of a faculty member willing to serve as his/her thesis advisor.

All components of the application, including transcript(s), graduate certificate(s), grading scale(s), language test results, assessment forms, a statement of interest, and the name of the faculty advisor must be uploaded no later than two months after an application is submitted through the OUAC portal. Applications that are incomplete after this time period will be closed.

Admission may be granted for entry in September, January or May. Completed applications should be uploaded at least one full semester (four months) before the expected date of admission (at least eight months for international students).

### Admission Process

Graduate student applications to programs in the College of Biological Science are handled by the Office of the Associate Dean, Research (ADR). Before submitting an application, applicants are strongly encouraged to view the "[Before you Apply](#)" and "[Admission Process](#)" webpages on the ADR Future Student's site.

Completed application instructions may also be found on the [Office of Graduate Studies](#) webpage or in the Graduate Calendar.

### Degree Requirements

Students in the PhD program must complete MCB\*7500 PhD Research Topics in Molecular & Cellular Biology. This two-semester course should be completed in the first year of study and normally within the first two semesters. Students without an MSc degree in Molecular and Cellular Biology or the equivalent are required to take one additional graduate course. Other courses may be taken on the recommendation of the Advisory Committee. An average of "B-minus" (70%) must be achieved in the prescribed courses. To be a candidate for the PhD degree, each student must pass a PhD Qualifying Exam. The Qualifying Examination is completed before the end of the fifth semester (for students with an MSc) or the end of the seventh semester (for students without an MSc).

The PhD thesis research must involve original enquiry into a well-defined question in the molecular biosciences. It is expected to result in the publication of one or more papers in high-quality peer-reviewed journals. The research must represent a significant contribution to the relevant research field.

All students beyond year 1 in the program are required to participate annually in the CBS Graduate Student Symposium by presenting a poster or giving a short talk describing their research progress.

## Interdepartmental Programs

Faculty in Molecular and Cellular Biology also participate in the interdepartmental programs in Bioinformatics, Biophysics and Biotechnology

## Collaborative Specializations

Faculty in Molecular and Cellular Biology also participate in the collaborative specializations in Neuroscience or Toxicology

## Courses

### MCB\*6310 Advanced Topics in Molecular and Cellular Biology F [0.50]

This course will consider fundamental cellular processes from multiple perspectives: biochemistry, cell biology, microbiology, molecular biology and genetics, and plant biology. Topics will vary from semester to semester but a multi-disciplinary approach to advanced concepts and experimental strategies will be a common theme.

*Department(s):* Department of Molecular and Cellular Biology

### MCB\*6370 Protein Structural Biology and Bioinformatics U [0.50]

This course explores structural biology from three perspectives: 1) the fundamental concepts in structural biology; 2) the methods used to determine structures (including x-ray crystallography, NMR, electron microscopy, and computational modeling); 3) the bioinformatic concepts and tools used to compare, contrast and assign biochemical function to protein structures and sequences. The course emphasizes building a conceptual and practical skill set that will be applicable to any structure related problem.

*Department(s):* Department of Molecular and Cellular Biology

**MCB\*6500 MSc Research Topics in Molecular and Cellular Biology U [1.00]**

This mandatory two semester course emphasizes the development and refinement of the skills of scientific communication. Students submit a written thesis proposal and present a public seminar on a contemporary subject in the molecular biosciences. MCB MSc students normally complete this course within the first two semesters of their program. Students will register in each semester and receive a grade of INP (in progress) at the end of the first semester and a grade at the end of the second semester.

*Department(s):* Department of Molecular and Cellular Biology

**MCB\*7500 PhD Research Topics in Molecular and Cellular Biology U [1.00]**

This mandatory two semester course emphasizes the development and refinement of the skills of scientific communication. Students submit a written thesis proposal and present a public seminar on a contemporary subject in the molecular biosciences. MCB PhD students normally complete this course within the first two semesters of their program. Students will register in each semester and receive a grade of INP (in progress) at the end of the first semester and a grade at the end of the second semester.

*Department(s):* Department of Molecular and Cellular Biology

BINF\*6110 [0.50] Genomic Methods for Bioinformatics

BIOT\*6500 [0.50] Molecular Biotechnology

## Pathobiology

The department offers programs of study leading to MSc and PhD degrees and a Graduate Diploma in the following four fields:

- **Comparative Pathology**
  - Avian pathology
  - Fish pathology
  - Wildlife and zoo animal medicine and pathology
  - Laboratory animal science
- **Immunology**
- **Veterinary Infectious Diseases**
  - Veterinary bacteriology
  - Veterinary parasitology
  - Veterinary virology
- **Veterinary Pathology**
  - Anatomic pathology
  - Clinical pathology

The department also participates in the Doctor of Veterinary Science (DVSc) program.

### Administrative Staff

#### Chair

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#### Patrick Boerlin

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#### Byram Bridle

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#### Jeff Caswell

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#### Robert A. Foster

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#### Claire Jardine

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#### Stefan M. Keller

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#### Brandon N. Lillie

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#### Janet I. MacInnes

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#### Bonnie A. Mallard

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#### J. Scott Weese

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#### R. Darren Wood

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#### Geoffrey A. Wood

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#### K. Sarah Wootton

BSc, PhD Guelph - Associate Professor

### Associated Faculty

#### Hugues Beaufre

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#### Moussa Sory Diarra

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#### Ravi Kulkarni

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#### John Prescott

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#### Dale A. Smith

DVM, DVSc Guelph - Professor

#### Craig Stephen

DVM, PhD Saskatchewan - Professor, Centre for Coastal Health, Nanaimo

#### Durda Slavic

DVM Zagreb, MSc, PhD Guelph - Veterinary Bacteriologist, Animal Health Laboratory, University of Guelph

### MSc Program

The MSc program is offered in four fields: 1) comparative pathology; 2) immunology; 3) veterinary infectious diseases; and 4) veterinary pathology. The primary objective is to provide students with training in conceptual and laboratory aspects of research, combined with advanced training in a field of knowledge relating to manifestations, basic mechanisms and host resistance for diseases of vertebrates.

### Admission Requirements

Applicants should have either a an honours degree in biological sciences with at least a 'B' average during the final 2 years of the program, or a DVM (or equivalent) degree with at least a 'B' average over the four years of the program. In either case, performance in relevant biomedical science courses, (e.g. microbiology, immunology, biochemistry, molecular biology, etc.) at a level above the minimum 'B' average is normally expected. Admission requires a statement of the applicant's interests and objectives and supportive letters of reference. An appropriate faculty advisor must be identified, as well as potential sources of funds for research and for provision of a stipend for the student. Applications may be submitted at any time. Initial enrolment can be in the Fall, Winter or Summer semesters, with a preference for the Fall.

## Degree Requirements

Students must complete at least 1.5 credits of prescribed courses with at least a 'B' average, and must satisfactorily write and defend a research thesis. Prescribed courses and additional courses are selected by the student in consultation with the advisor and advisory committee based on the student's background and their research and career objectives. The Academic and Professional Skills in Pathobiology course PABI\*6430 and the MSc Seminar in Pathobiology course PABI\*6440 are prescribed for all MSc students. The thesis research is planned by the student in consultation with the advisor. Research plans and progress must be approved by the advisory committee. The thesis defence includes a seminar presentation and a final oral examination by a committee of graduate faculty members.

See also the MSc Degree Regulations in the Graduate Calendar.

## PhD Program

The PhD program is offered in four fields: 1) comparative pathology; 2) immunology; 3) veterinary infectious diseases; and 4) veterinary pathology. The program is designed primarily for students who aspire to a career involving research on the biology of mechanisms of diseases in vertebrates. The program provides advanced training in conceptual and laboratory aspects of independent research, combined with advanced training in one or more fields of knowledge. The major emphasis is on the generation and critical evaluation of scientific knowledge relating to the causes, mechanisms and/or consequences of diseases affecting a particular species, organ system or biological process or to the understanding of host resistance and basic mechanisms of health or disease in vertebrates. DVM (or equivalent) graduates may obtain some of the practical experience required for specialty certification in veterinary anatomic pathology, clinical pathology, laboratory animal science, microbiology or parasitology.

## Admission Requirements

The usual requirement for admission to the PhD program is the completion of an approved MSc degree with a minimum 'B+' average and strongly supportive letters from referees familiar with the background of the applicant. Performance in relevant biomedical science courses, (e.g. microbiology, immunology, biochemistry, molecular biology, etc) at a level above the 'B+' average is normally expected. Students may apply for admission into the PhD program before completing the MSc program, providing that they have a minimum 'A' average and a demonstrated capacity for independent research. Some students with demonstrated potential for independent research and a superior academic record during their baccalaureate or DVM programs may be admitted directly into the PhD program.

Admission requires a statement of the applicant's interests and objectives and supportive letters of reference. An appropriate faculty advisor must be identified, as well as potential sources of funds for research and provision of a stipend for the student. Applications may be submitted at any time. Initial enrolment can be in the Fall, Winter or Summer semesters, with a preference for the Fall.

## Degree Requirements

Students must have successfully completed the Academic and Professional Skills in Pathobiology course PABI\*6430 and the Doctoral Seminar in Pathobiology course PABI\*6450, and have obtained at least a 'B' average in all courses prescribed by the advisory committee. There are no other specific course requirements. Prescribed courses and additional courses are selected by the student in consultation with the advisor and advisory committee based on the student's background, their research and career objectives. Students are required to satisfactorily complete a qualifying examination before the end of the fifth semester if they possess an MSc degree, or before the end of the seventh semester if they possess an honours baccalaureate or DVM degree. The qualifying examination is conducted by a committee of graduate faculty members with expertise in the areas of study, and includes written and oral components. The qualifying examination covers a breadth of knowledge of topics related to the student's research area, and depth of knowledge within this research area. To successfully complete the examination, students must have a broad general understanding of one of the departmental fields of study, and a current and detailed understanding of one or two additional areas in their field of study. The advisory committee identifies selected areas of study by the end of the second semester. In addition, the advisory committee is required to confirm that the student has demonstrated both ability and promise in research. This is based on performance in the research project and in courses and other academic activities.

The thesis research is planned by the student in consultation with the advisor. The proposed thesis research is developed and defended as part of the course PABI\*6450, Graduate Seminar in Pathobiology. Research plans and progress must be approved by the advisory committee. The program is completed with the satisfactory presentation and defence of a thesis, which includes a seminar presentation and a final oral examination by a committee that includes an external examiner and members of the graduate faculty.

See also the Degree Regulations in the Graduate Calendar.

## DVSc Program

The Department of Pathobiology participates in the DVSc program which provides advanced training in a specialty discipline of veterinary medicine, combined with course work and a thesis-based research project. Specialty training is offered in the areas of veterinary anatomic pathology, veterinary clinical pathology, veterinary clinical microbiology, laboratory animal science, wildlife and zoo animal medicine and pathology, avian and exotic medicine and pathology, and fish pathology. The research project addresses an applied aspect of an important disease problem in vertebrates. The program provides practical training for candidates preparing for specialty board certification in veterinary anatomic pathology, veterinary clinical pathology, laboratory animal science or veterinary clinical microbiology. Refer to the Degree Regulations in the Graduate calendar for more information.

## Admission Requirements

Applicants require a DVM (or equivalent) degree with high academic standing from a program that provides eligibility for the practice of veterinary medicine in Ontario. Alternatively, applicants with a DVM (or equivalent) degree can be admitted after completion of an acceptable graduate diploma, MSc, or PhD degree with an upper 'B' average. Admission requires the identification of a faculty advisor and a source of personal support for the student. If these have not been arranged by the applicant, a statement of the applicant's interests and objectives and supportive letters of reference are required to assist with the identification of an appropriate faculty advisor and potential sources of funds for research and student stipend. Several stipends for DVSc candidates are available intermittently for training in some disciplines. As these funds become available, stipends are awarded to the most qualified applicant(s) based on completed applications for admission to the DVSc program. Applications may be submitted at any time. Initial enrolment can be in the Fall, Winter or Summer semesters.

## Degree Requirements

The degree requires a minimum of nine semesters of full-time study; the completion of at least 2.5 credits in courses prescribed by the student's advisory committee including completion of the department's graduate seminar course, with an overall average of at least 'B-', and satisfactory completion of a qualifying examination, thesis and final oral examination.

See also the Degree Regulations in the Graduate Calendar.

## Collaborative Specializations

### Toxicology

The Department of Pathobiology participates in the MSc collaborative specialization in toxicology. The faculty members' research and teaching expertise includes aspects of toxicology; they may serve as advisors for MSc students.

Please consult the Toxicology listing for a detailed description of the MSc collaborative specialization.

## Graduate Diploma Program

The diploma program is offered in four fields: 1) comparative pathology; 2) immunology; 3) veterinary infectious diseases; and 4) veterinary pathology. The objective is to provide advanced practical training in a field of veterinary pathology to veterinarians working in industry, government or in private practice. The program emphasizes practical and course-based applied training in anatomic pathology, clinical pathology, avian medicine and pathology, laboratory animal science, or wildlife and zoo animal pathology. The Diploma program does not normally result in eligibility for specialty certification.

## Admission Requirements

Applicants require a DVM (or equivalent) degree with acceptable academic standing. Admission requires the prior identification of a faculty advisor and a source of personal support for the student.

## Diploma Requirements

The Graduate Diploma requires three semesters of full time study and completion of 1.5 credits of prescribed courses, including 0.5 credits in an applied course and no more than 0.5 credits in a Special Topics course. The remaining credits may be in the defined area of study, as prescribed by the faculty advisor. Diploma students must satisfactorily pass a final oral comprehensive examination on knowledge in their field of study. It will be conducted by faculty members in the Department of Pathobiology. There is no thesis, but students are required to write a paper that the advisor considers ready for submission to a peer reviewed scientific journal.

See also the Graduate Diploma Regulations of the Faculty of Graduate Studies.

## Courses

### General

#### PABI\*6430 Academic and Professional Skills in Pathobiology S,F [0.00]

Students will be introduced to fundamental elements of scientific research and communication and to various academic skills through lectures, seminars, and completion of in class activities. Throughout the course, relevant ethical, and regulatory issues will be discussed.

*Department(s):* Department of Pathobiology

**PABI\*6440 MSc Seminar in Pathobiology S,F,W [0.50]**

Students registered in the MSc program will develop a written critical review of the literature and plan for their thesis research. This material will also be presented in the form of a public seminar. Students are also required to provide oral and written critical reviews of thesis plan presentations.

*Prerequisite(s):* PABI\*6430

*Department(s):* Department of Pathobiology

**PABI\*6450 Doctoral Seminar in Pathobiology S,F,W [0.50]**

Students registered in the PhD or DVSc programs will develop a written critical review of the literature and plan for their thesis research. This material will also be presented in the form of a public seminar. Students are also required to provide oral and written critical reviews of the thesis plan presentations of other students.

*Prerequisite(s):* PABI\*6430

*Department(s):* Department of Pathobiology

**PABI\*6960 Special Topics in Pathobiology F,W,S [0.50]**

In-depth independent study of subjects related to student's principal area of interest. Major paper(s), laboratory studies, and/or written and oral examination, with or without seminar preparation.

*Restriction(s):* Instructor consent required.

*Department(s):* Department of Pathobiology

**Comparative Pathology****PABI\*6050 Applied Avian Pathology I F [0.50]**

Examination and interpretation of gross and microscopic lesions of domestic poultry.

*Restriction(s):* Instructor consent required. Veterinarians licensed by CVO. Students who are not DVM students and/or do not have a protective rabies titre need instructors permission.

*Department(s):* Department of Pathobiology

**PABI\*6060 Applied Avian Pathology II W [0.50]**

A continuation of PABI\*6050, emphasizing seasonal differences in diseases as well as diseases more commonly associated with winter conditions.

*Prerequisite(s):* PABI\*6050

*Restriction(s):* Instructor consent required. Veterinarians licensed by CVO. Students who are not DVM students and/or do not have a protective rabies titre need instructors permission.

*Department(s):* Department of Pathobiology

**PABI\*6070 Applied Avian Pathology III S [0.50]**

A continuation of PABI\*6060, emphasizing seasonal differences in diseases as well as diseases more commonly associated with summer conditions.

*Prerequisite(s):* PABI\*6050 and PABI\*6060

*Restriction(s):* Instructor consent required. Veterinarians licensed by CVO. Students who are not DVM students and/or do not have a protective rabies titre need instructors permission.

*Department(s):* Department of Pathobiology

**PABI\*6221 Comparative Veterinary Pathology I U [0.50]**

Pathological changes associated with diseases of amphibia, reptiles, wild and captive non-domestic birds, and wild mammals including fur-bearers.

*Offering(s):* Offered in even-numbered years.

*Restriction(s):* Instructor consent required. Students who are not DVM students and/or do not have a protective rabies titre need instructors permission.

*Department(s):* Department of Pathobiology

**PABI\*6222 Comparative Veterinary Pathology II U [0.50]**

Pathological changes associated with diseases of poultry and pet birds, fish and various laboratory animals.

*Offering(s):* Offered in even-numbered years.

*Restriction(s):* Instructor consent required.

*Department(s):* Department of Pathobiology

**PABI\*6630 Applied Comparative Pathology I U [0.50]**

Introductory course in the diagnostic pathology of mammals, birds, reptiles, amphibians, and fish. Cases may be restricted by animal taxa or context (e.g., free-ranging Canadian wildlife, zoological collections, aquaculture). The three-semester course in Applied Comparative Pathology builds in expected level of accomplishment.

*Restriction(s):* Veterinarians licensed by CVO. Students who are not DVM students and/or do not have a protective rabies titre need instructors permission.

*Department(s):* Department of Pathobiology

**PABI\*6640 Applied Comparative Pathology II U [0.50]**

Intermediate course in the diagnostic pathology of mammals, birds, reptiles, amphibians, and fish. Cases may be restricted by animal taxa or context (e.g., free-ranging Canadian wildlife, zoological collections, aquaculture). The three-semester course in Applied Comparative Pathology builds in expected level of accomplishment.

*Prerequisite(s):* PABI\*6630

*Restriction(s):* Veterinarians licensed by CVO. Students who are not DVM students and/or do not have a protective rabies titre need instructors permission.

*Department(s):* Department of Pathobiology

**PABI\*6650 Applied Comparative Pathology III U [0.50]**

Advanced course in the diagnostic pathology of mammals, birds, reptiles, amphibians, and fish. Cases may be restricted by animal taxa or context (e.g., free-ranging Canadian wildlife, zoological collections, aquaculture). The three-semester course in Applied Comparative Pathology builds in expected level of accomplishment.

*Prerequisite(s):* PABI\*6630 PABI\*6640

*Restriction(s):* Veterinarians licensed by CVO. Students who are not DVM students and/or do not have a protective rabies titre need instructors permission.

*Department(s):* Department of Pathobiology

**PABI\*6700 Laboratory Animal Science U [0.50]**

Basic information on various aspects of laboratory animal science, including IACUC function, regulatory oversight, ethics, historical review of animal research, animal models and alternatives, experimental design and considerations, biology, management and uses of common species in research.

*Restriction(s):* Instructor consent required.

*Department(s):* Department of Pathobiology

**PABI\*6710 Applied Laboratory Animal Science I U [0.50]**

This course will emphasize practical aspects of laboratory animal science including research protocol review, writing and reviewing standard operating procedures, animal monitoring, pathology procedures, and case management.

*Restriction(s):* Instructor consent required.

*Department(s):* Department of Pathobiology

**PABI\*6720 Applied Laboratory Animal Science II U [0.50]**

Continuation of I with emphasis on biohazard and personnel safety, monitoring for disease, quality control and diagnostic procedures.

*Restriction(s):* Instructor consent required.

*Department(s):* Department of Pathobiology

**PABI\*6730 Applied Laboratory Animal Science III U [0.50]**

Continuation of I and II, with emphasis on a comparison of programs and procedures in other facilities in Canada, nonhuman primate medicine, and surgical, clinical and necropsy procedures.

*Restriction(s):* Instructor consent required.

*Department(s):* Department of Pathobiology

**PABI\*6740 Avian Diseases U [0.50]**

Detailed study of recent concepts of preventive medicine, diagnosis and therapeutics as applied to clinical recognition and control of avian diseases.

*Restriction(s):* Instructor consent required.

*Department(s):* Department of Pathobiology

**Immunology****PABI\*6100 Immunobiology F [0.50]**

Major areas of immunology, including initiation, regulation, receptors, genetics, immune system development and function.

*Department(s):* Department of Pathobiology

**PABI\*6190 Topics in Immunology W [0.50]**

Aspects of immune and non-specific host resistance, diagnostic immunology and immune-mediated disease.

*Department(s):* Department of Pathobiology

**Veterinary Infectious Diseases****PABI\*6000 Bacterial Pathogenesis F [0.50]**

An overview of key concepts in bacterial pathogenesis with emphasis on veterinary and zoonotic pathogens.

*Department(s):* Department of Pathobiology

**PABI\*6330 Viral Diseases F [0.50]**

A study of important viral diseases of animals, with emphasis on etiology, host responses, diagnosis and control.

*Offering(s):* Offered in odd-numbered years.

*Department(s):* Department of Pathobiology

**PABI\*6350 Molecular Epidemiology of Bacterial Diseases F [0.50]**

This is a basic introduction to molecular epidemiology of bacterial diseases. It provides an understanding of molecular epidemiology methodologies and of their use for improving our understanding of infectious diseases epidemiology and control.

*Prerequisite(s):* STAT\*2040 Statistics I

*Restriction(s):* Lab component: limited number of participants and WHIMIS certificate compulsory.

*Department(s):* Department of Pathobiology

**PABI\*6550 Epidemiology of Zoonoses W [0.50]**

Characterization and distribution of diseases common to people and animals.

*Department(s):* Department of Pathobiology

**Veterinary Pathology****PABI\*6030 Applied Clinical Pathology I F,W,S [0.50]**

Introduction to laboratory procedures and interpretation of data arising from hematology, cytology, clinical chemistry, urinalysis and hemostasis analysis of clinical material (Intended for students training in clinical pathology.)

*Restriction(s):* Veterinarians licensed by CVO.

*Department(s):* Department of Pathobiology

**PABI\*6040 Applied Clinical Pathology II U [0.50]**

A continuation of PABI\*6030 with greater depth in the interpretation of data and increased understanding of ancillary diagnostic methods applied in clinical case material. (Intended for students in training in clinical pathology.)

*Prerequisite(s):* PABI\*6030

*Restriction(s):* Veterinarians licensed by CVO.

*Department(s):* Department of Pathobiology

**PABI\*6041 Applied Clinical Pathology III U [0.50]**

A continuation of PABI\*6040 with independent and comprehensive interpretation of diagnostic test results, and analysis of laboratory quality assurance quality control procedures. (Intended for students training in clinical pathology)

*Prerequisite(s):* PABI\*6030 and PABI\*6040

*Restriction(s):* Veterinarians licensed by CVO.

*Department(s):* Department of Pathobiology

**PABI\*6080 Diagnostic Pathology I S,F,W [0.50]**

An introductory course of diagnostic pathology, including all body systems but emphasizing diseases affecting the whole body and respiratory, urinary and digestive (including liver and pancreas) systems. (Intended for students in training in anatomic pathology.)

*Restriction(s):* Instructor consent required. Veterinarians licensed by CVO, engaged in applied anatomic pathology training

*Department(s):* Department of Pathobiology

**PABI\*6090 Diagnostic Pathology II S,F,W [0.50]**

An intermediate course that builds on the skills acquired in PABI\*6080 and further enhances diagnostic veterinary pathology skills to include diseases of the nervous, endocrine and musculoskeletal systems. (Intended for students training in anatomic pathology.)

*Prerequisite(s):* PABI\*6080

*Restriction(s):* Veterinarians licensed by CVO, engaged in applied anatomic pathology training

*Department(s):* Department of Pathobiology

**PABI\*6091 Diagnostic Pathology III S,F,W [0.50]**

An advanced course that builds on the skills acquired in PABI\*6090 and further enhances diagnostic veterinary pathology skills to include diseases of all organ systems. (Intended for students training in anatomic pathology.)

*Prerequisite(s):* PABI\*6080 and PABI\*6090

*Restriction(s):* Veterinarians licensed by CVO, engaged in applied anatomic pathology training

*Department(s):* Department of Pathobiology

**PABI\*6104 Mechanisms of Disease W [0.50]**

Molecular, cellular and tissue processes involved in the pathogenesis of adaptive, degenerative, inflammatory, infectious, proliferative and neoplastic diseases.

*Department(s):* Department of Pathobiology

**PABI\*6300 Clinical Pathology I U [0.50]**

Principles and applications of veterinary hematology and cytology, with emphasis on the hematopoietic systems.

*Restriction(s):* Veterinarians licensed by CVO.

*Department(s):* Department of Pathobiology

**PABI\*6320 Clinical Pathology II W [0.50]**

In depth study of principles and applications of biochemical tests to evaluate the function of selected organ systems, including the renal, hepatic, pancreatic and endocrine systems.

*Prerequisite(s):* PABI\*6300

*Restriction(s):* Veterinarians licensed by CVO.

*Department(s):* Department of Pathobiology

## Philosophy

The Department of Philosophy includes a wide range of expertise which allows students accepted into our graduate programs to both extend their philosophical education at the graduate level and to concentrate their research project in a number of areas. These include the history of philosophy, ethics, social and political philosophy, feminist philosophy, epistemology, philosophy of mind, metaphysics, and philosophy of science. There is also a diversity of approaches within the department, with faculty expertise in analytic, continental and other philosophical traditions and approaches. We offer PhD, MA (thesis) and MA (major research paper) programs.

### Administrative Staff

#### Chair

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#### Monique Deveau

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#### Peter Eardley

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#### Karen L. Houle

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#### Stefan Linquist

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#### Mark McCullagh

BA Toronto, PhD Pittsburgh - Associate Professor and Chair

#### Omid Payrow Shabani

BA, MA Carleton, PhD Ottawa - Professor

#### John Russon

BA Regina, MA, PhD Toronto - Professor

#### Patricia Sheridan

BA McGill, MA Concordia, PhD Western - Associate Professor

#### Andrew Wayne

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#### Karen Wendling

BA Michigan State, MA, PhD Toronto - Associate Professor

### Associated Graduate Faculty

#### Ken Dorter

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#### Jay Lampert

BA, MA, PhD, Toronto - Professor Emeritus, Philosophy, University of Guelph

#### Jeff Mitscherling

BA California (Santa Barbara), MA McMaster, PhD Guelph - Retired Faculty, Philosophy, University of Guelph

### MA Program

The Philosophy Department includes a wide range of expertise which allows students accepted into the MA program to both extend their philosophical background at the graduate level and to concentrate their research project in any of a number of different areas such as the history of philosophy, ethics, social and political philosophy, feminist philosophy, epistemology, philosophy of mind, metaphysics, philosophy of science. It is primarily a research degree and the program will involve either an MA thesis or the smaller Major Research Project.

### Admission Requirements

A four-year bachelor's degree from a recognized university. Normally this will include at least a major in philosophy, although the program is also open to students who may not have had a substantial number of philosophy undergraduate courses but who provide evidence of philosophical ability. In all cases, in order to be considered for admission to the MA program, the department requires that the average grade over the last 10.00 credits of studies (i.e., a normal two years of full-time studies on the University of Guelph system) be at least 75%. All applicants are required to submit a sample of writing. Further details can be found on the [Philosophy Department website](#).

### Degree Requirements

Students enrol in one of two study options: 1) course work and major research project (1 year), or 2) thesis (2 years).

Regardless of the stream chosen, the MA in Philosophy at Guelph is a research degree, in which the responsibility for study rests primarily with the student. Students in both streams are expected to develop their own topic for research.

### Course Work and Major Research Project (MRP)

- Total of 4 credits in graduate course work required.
- 5 graduate courses (0.5 credits each) plus the mandatory MA Seminar (0.5 credits)
- Major Research Project (1.0 credit)

### Thesis

- Total of 2 credits in graduate course work required
- At least 3 graduate courses (0.5 credits each) plus the mandatory MA Seminar (0.5 credits)
- Completion and defence of a thesis

### PhD Program

The Department of Philosophy includes a wide range of expertise which allows students accepted into our graduate programs to both extend their philosophical education at the graduate level and to concentrate their research project in a number of areas. These include the history of philosophy, ethics, social and political philosophy, feminist philosophy, epistemology, philosophy of mind, metaphysics, and philosophy of science. There is also a diversity of approaches within the department, with faculty expertise in analytic, continental and other philosophical traditions and approaches. The aim of the program is to develop philosophers who are well rounded in the traditional areas of study and who have achieved a high level of expertise in their special areas of research.

### Admission Requirements

Admission to the program is restricted to those who have an MA in philosophy, or an outstanding record in undergraduate studies in philosophy.

### Degree Requirements

Students are normally required to take between six and ten courses plus the PhD Research Seminar (PHIL\*6960). Students must also demonstrate knowledge in at least five designated fields of study. This may be done by course work, by examination, by thesis or by a suitable combination of these. Students must pass an Oral Qualifying Examination by the end of their fifth semester in the program. Students in the program may be required to demonstrate competence in one or more skills which their advisory committee decides, in consultation with the program officer, is needed for their dissertation (e.g. a language other than English). PhD candidates must submit a thesis of not more than 75,000 words (250 pages). More details are available at <http://www.uoguelph.ca/philosophy>.

### Collaborative Specializations

#### International Development Studies

The Department of Philosophy participates in the MA/PhD collaborative specialization in International Development Studies (IDS). Students in this option register in an MA/PhD program in the department and IDS. Those faculty members whose research and teaching expertise includes aspects of international development studies may serve as advisors for MA/PhD students. Please consult the International Development Studies listing for a detailed description of the MA/PhD collaborative specialization and the special additional requirements for each of the participating departments.

### Courses

Except where specified, the courses listed below may be offered in any semester, subject to student demand and the availability of an instructor.

<b>PHIL*6000 Value Theory U [0.50]</b>
A critical examination of some selected contemporary works in value theory or aesthetics. <i>Department(s):</i> Department of Philosophy
<b>PHIL*6060 Logic U [0.50]</b>
A course designed to bring the individual student to the level of competence in logical techniques and theory required for graduate studies. <i>Department(s):</i> Department of Philosophy

**PHIL\*6110 Philosophy of Religion U [0.50]**

A critical examination of some selected major works or central problems in the philosophy of religion.

*Department(s):* Department of Philosophy

**PHIL\*6120 Philosophy of Mind U [0.50]**

A study of contemporary theories of mind and philosophies of psychology.

*Department(s):* Department of Philosophy

**PHIL\*6140 Contemporary European Philosophy I U [0.50]**

A study of the historical and contemporary origins of existentialism, phenomenology and post-modernism, concentrating on one or several of the classic texts.

*Department(s):* Department of Philosophy

**PHIL\*6150 Contemporary European Philosophy II U [0.50]**

A study of the historical and contemporary origins of existentialism, phenomenology and post-modernism, concentrating on texts not covered in PHIL\*6140 in the same year.

*Department(s):* Department of Philosophy

**PHIL\*6200 Problems of Contemporary Philosophy U [0.50]**

A study of a particular set of problems in contemporary philosophy.

*Department(s):* Department of Philosophy

**PHIL\*6210 Metaphysics U [0.50]**

A critical examination of some selected major works or central problems in metaphysics.

*Department(s):* Department of Philosophy

**PHIL\*6220 Epistemology U [0.50]**

A critical examination of some selected major works or central problems in epistemology.

*Department(s):* Department of Philosophy

**PHIL\*6230 Ethics U [0.50]**

A critical examination of some selected contemporary works or problems in ethical theory.

*Department(s):* Department of Philosophy

**PHIL\*6240 Biomedical Ethics U [0.50]**

A critical examination of some selected contemporary works or of problems in biomedical ethics.

*Department(s):* Department of Philosophy

**PHIL\*6310 Plato U [0.50]**

A study of some of the major works of Plato.

*Department(s):* Department of Philosophy

**PHIL\*6311 Aristotle U [0.50]**

A study of some of the major works of Aristotle.

*Department(s):* Department of Philosophy

**PHIL\*6320 Medieval Philosophy U [0.50]**

A close examination of particular problems and texts of the medieval period

*Department(s):* Department of Philosophy

**PHIL\*6340 Modern Philosophy U [0.50]**

An examination of major texts, from Descartes to Mill.

*Department(s):* Department of Philosophy

**PHIL\*6500 John Locke U [0.50]**

A critical examination of the works of John Locke.

*Department(s):* Department of Philosophy

**PHIL\*6530 Kant U [0.50]**

A critical examination of the works of Immanuel Kant.

*Department(s):* Department of Philosophy

**PHIL\*6600 Social and Political Philosophy U [0.50]**

A critical examination of some selected contemporary works or central problems in the field of social philosophy.

*Department(s):* Department of Philosophy

**PHIL\*6700 Survey of Ancient Philosophy U [0.50]**

A survey of ancient philosophy.

*Department(s):* Department of Philosophy

**PHIL\*6710 Survey of Early Modern Philosophy U [0.50]**

A survey of modern philosophy from Hobbes to Hume.

*Department(s):* Department of Philosophy

**PHIL\*6720 History of the Philosophy of Science U [0.50]**

A survey of the history of the philosophy of science from the Presocratics to the Positivists.

*Department(s):* Department of Philosophy

**PHIL\*6730 Contemporary Philosophy of Science U [0.50]**

An examination of the contemporary discipline of the philosophy of science.

*Department(s):* Department of Philosophy

**PHIL\*6740 Philosophy of Biology U [0.50]**

A general introduction to the history and philosophy of biology.

*Department(s):* Department of Philosophy

**PHIL\*6760 Science and Ethics U [0.50]**

A consideration of the problems which arise in the conjunction of science and ethics.

*Department(s):* Department of Philosophy

**PHIL\*6810 Survey of Late Modern Philosophy U [0.50]**

A survey of modern philosophy from Kant to the late 19th century.

*Department(s):* Department of Philosophy

**PHIL\*6900 Reading Course U [0.50]**

*Department(s):* Department of Philosophy

**PHIL\*6930 Selected Topics I U [0.50]**

Topics in this course will vary from offering to offering.

*Department(s):* Department of Philosophy

**PHIL\*6940 Selected Topics II U [0.50]**

Topics in this course will vary from offering to offering.

*Department(s):* Department of Philosophy

**PHIL\*6950 MA Seminar U [0.50]**

A seminar course in which students work on developing a range of academic skills for doing professional philosophy. This course is pass/fail and is mandatory for all incoming MA students. Please refer to the Philosophy Department website for a comprehensive description of this course.

*Department(s):* Department of Philosophy

**PHIL\*6960 PhD Graduate Seminar F,W [0.50]**

A seminar course in which students work on developing a range of academic skills for doing professional philosophy. This course is pass/fail and is mandatory for all first year PhD students. Please refer to the Philosophy Department website for a comprehensive description of this course.

*Department(s):* Department of Philosophy

**PHIL\*6990 Major Research Project U [1.00]**

A major research project undertaken by students doing an MA by course work, under the supervision of a faculty member.

*Department(s):* Department of Philosophy

## Physics

The Departments of Physics at the Universities of Guelph and Waterloo offer a joint program leading to MSc and PhD degrees in the following fields:

- Astrophysics and Gravitation
- Atomic, Molecular and Optical Physics
- Biophysics
- Chemical Physics
- Condensed Matter and Material Physics
- Industrial and Applied Physics
- Subatomic Physics
- Quantum Computing

The Guelph-Waterloo Physics Institute consists of members from both university departments and is administered by a joint co-ordinating committee. Students interested in graduate work in physics at either university should consult the application requirements and the on-line application procedures available from the web-site <http://gwp.on.ca>. Students are ultimately registered at the university at which their advisor is located. A student comes under the general regulations of the university at which he or she is registered, and the degree is granted by that university.

### Administrative Staff

Graduate teaching and research in physics at the University of Guelph are operated through Graduate Studies in Physics, University of Guelph, University of Waterloo.

#### Director of the Institute

Melanie Campbell (Waterloo - (519) 888-4567, Ext. 36273)  
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#### Associate Director of the Institute

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#### Assistant to the Director

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#### Graduate Program Assistant

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### Graduate Faculty

#### Leonid S. Brown

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#### John R. Dutcher

BSc Dalhousie, MSc British Columbia, PhD Simon Fraser - Professor and Canada Research Chair in Soft Matter & Biological Physics and Director Nanoscience

#### Paul E. Garrett

BSc Queen's, MSc, PhD McMaster - Professor, Chair

#### Ralf Gellert

Dipl Phys, PhD Darmstadt - Associate Professor

#### Alexandros Gezerlis

Dipl National Technical University Athens, PhD Urbana-Champaign - Assistant Professor

#### De-Tong Jiang

BSc Jilin, PhD Simon Fraser - Associate Professor

#### Stefan W. Kycia

BSc McGill; MS Pennsylvania; PhD Iowa - Associate Professor

#### Vladimir Ladizhansky

BS Moscow Institute of Physics and Technology; MS, PhD Weizmann Institute of Science (Rehovot, Israel) - Professor and Canada Research Chair in Biophysics Tier II

#### Michael Massa

BSc Guelph, MSc, PhD McMaster - Assistant Professor

#### Dennis M\"ucher

BSc University of Cologne, Germany, Ph.D University of Cologne, Germany - Assistant Professor

#### Elisabeth J. Nicol

BSc Mount Allison, MSc, PhD McMaster - Professor

#### Joanne M. O'Meara

BSc, PhD McMaster - Professor

#### Eric Poisson

BSc Laval, MSc, PhD Alberta - Professor

#### Xiao-Rong Qin

BSc, MSc Tsinghua (Beijing), PhD Simon Fraser - Associate Professor and Associate Graduate Coordinator

#### Carl E. Svensson

BSc, PhD McMaster - Professor

#### Robert Wickham

BSc Toronto, PhD Chicago - Associate Professor and Graduate Coordinator, Associate Chair (Graduate), Associate Director Graduate Studies in Physics, University of Guelph, University of Waterloo

#### Martin Williams

PhD Imperial College, London - Associate Professor and Undergraduate Coordinator/Academic Counsellor, and Associate Chair (Undergraduate)

### Graduate Faculty from the University of Waterloo

#### Nasser Abukhdeir

BSc Carnegie Mellon, MChE Carnegie Mellon, PhD McGill University - Assistant Professor

#### Niayesh Afshordi

BA Iran, BSc Providence, PhD Princeton - Associate Professor

#### Michal Bajcsy

BS Harvard, PhD Harvard - Assistant Professor

#### Michael Balogh

BSc McMaster, PhD Victoria - Professor and Associate Chair of Department of Physics and Astronomy

#### Dayan Ban

BSc, MSc University of Science and Technology China, PhD University of Toronto - Professor

#### Jonathan Baugh

BS Tennessee, PhD North Carolina - Associate Professor

#### Kostadinka Bizheva

BS, MS Plovdiv, MS, PhD Tufts - Associate Professor

#### Avery Broderick

BS Stoney Brook, PhD CalTech - Associate Professor

#### Raffi Budakian

BS UCLA, MS UCLA, PhD UCLA - Professor

#### Anton Burkov

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#### Melanie C. Campbell

BSc Toronto, MSc Waterloo, PhD Australian National, FAAO - Professor

#### Z.Y. 'Jeff' Chen

BSc Fuden, PhD Maryland - Professor

#### Kyung Soo Choi

BSc Stony Brook University, PhD CalTech - Assistant Professor

#### David Cory

BA, PhD Case Western Reserve - Professor

#### Joseph Emerson

MSc, PhD British Columbia - Associate Professor

#### Michael Fich

BSc Waterloo, MSc, PhD California - Professor

#### James Forrest

BSc Simon Fraser, MSc, PhD Guelph - Professor, Associate Dean of Research, Faculty of Science and University Research Chair

#### Michel Gingras

BSc, MSc Laval, PhD British Columbia - Professor and Canada Research Chair in Condensed Matter Theory & Statistical Mechanics

#### Bae-Yeun Ha

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#### Thorsten Hesjedal

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#### Robert Hill

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#### Michael Hudson

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#### Rajibul Islam

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**Achim Kempf**

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BA Oxford, PhD Oxford - Professor

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MSc, PhD Novosibirsk - Professor

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**Norbert L Lütkenhaus**

MSc München, PhD Scotland, Habilitation Germany - Professor

**Hamed Majedi**

BSc K.N. Toosi University of Technology, MSc Amir Kabir University of Technology, PhD University of Waterloo - Professor

**Robert B. Mann**

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**Matteo Mariantoni**

MSc Chambers University of Technology, PhD Technical University of Munich - Assistant Professor

**James Martin**

BSc, MSc, PhD Waterloo - Associate Professor

**Eduardo Martin-Martinez**

BSc, MSc, PhD Universidad Complutense de Madrid - Assistant Professor

**Mark Matsen**

BSc Simon Fraser, MA, PhD Guelph - Professor

**Brian McNamara**

BS Villanova, MA, PhD Virginia - Professor and Department Chair

**Roger Melko**

BSc, MSc Waterloo, MA, PhD UC Santa Barbara - Associate Professor and Canada Research Chair in Computational Many-Body Physics

**Guo-Xing Miao**

BSc Shandong University, PhD Brown University - Assistant Professor

**Zoran Miskovic**

PhD University of Belgrade - Professor

**Ruxandra Moraru**

- Associate Professor

**Michele Mosca**

BMath Waterloo, MSc, DPhil Oxford - Professor

**Linda F. Nazar**

BSc British Columbia, PhD Toronto - Professor

**Kevin Resch**

BSc Queen's, MSc, PhD Toronto - Associate Professor

**Pierre-Nicholas Roy**

BSc McGill, MSc, PhD Université de Montréal - Professor

**Joseph Sanderson**

BSc, PhD London - Associate Professor

**Crystal Senko**

BSc Duke University, PhD University of Maryland - Assistant Professor

**Donna Strickland**

BEng McMaster, PhD Rochester - Associate Professor

**James Taylor**

BSc, MSc Toronto, PhD Victoria - Associate Professor

**Russell Thompson**

BSc Ottawa, MSc Regina, PhD Western Ontario - Associate Professor

**Adam Wei Tsen**

BS UC Berkley, PhD Cornell University - Assistant Professor

**Zbigniew Wasilewski**

MSc University of Warsaw, PhD Institute of Physics, Polish Academy of Sciences - Professor

**Christopher Wilson**

BS MIT, PhD Yale University - Associate Professor

**David Yevick**

AB Harvard, MA, PhD Princeton, Docent Lund - Professor

## MSc Program

The MSc programs is offered in the following fields: 1) astrophysics and gravitation; 2) atomic, molecular and optical physics; 3) biophysics; 4) chemical physics; 5) condensed matter and material physics; 6) industrial and applied physics; 7) subatomic physics; and 8) quantum computing.

## Admission Requirements

Application for admission should be made as early as possible using on-line application methods described on the web-site <https://uwaterloo.ca/waterloo-guelph-physics-graduate-studies/student-resources/how-apply>. Successful applicants are encouraged to start their graduate studies in May or September, but a January starting date is possible. Program offices should be consulted for admission deadlines.

The admission requirements are as follows:

- An honours BSc degree in physics (or equivalent) with at least a B standing (75%) from a recognized university.
- Three letters of reference, two of which normally are from academic sources.
- Proof of competency in English (for applicants whose prior education was in a language other than English). See the University regulations on English Language Proficiency Certification.
- GRE Physics Subject Test score for all applicants who have completed their post-secondary education outside of Canada.

Successful applicants are encouraged to start their graduate studies in May or September, but a January starting date is possible. Academic transcripts and other supporting documents should be forwarded as soon as they become available. Admission to the program cannot be granted until all requirements have been met and all documents submitted.

Applications are considered by the Admissions Committee. It should be noted that students will normally be admitted only if an advisor can be found to oversee their research. Since there are a limited number of openings each year, applicants are advised to state alternative areas of research on the preference form supplied (see web-site <http://gwp.on.ca/>).

## Degree Requirements

Students enrol in one of two study options: 1) thesis, or 2) course work and major research project.

### Thesis

Four one-term courses (at least 2.0 course credits) acceptable for graduate credit and a thesis based on original research are required. The subject of research must be approved by the candidate's advisory committee and the thesis must be read and approved by the advisory committee. One of the four courses may be an undergraduate course approved by the student's advisory committee and the Graduate Program Coordinator. If it is a physics course, it must be at the fourth-year level.

For all students one of the courses must include at least one of Quantum Mechanics 1 (PHYS\*7010), Introduction to Quantum Field Theory (PHYS\*7030), Statistical Physics 1 (PHYS\*7040), Electromagnetic Theory (PHYS\*7060), and Fundamentals of Astrophysics (PHYS\*7810). An MSc student in this program who shows a particular aptitude for research and has a superior record in fourth-year undergraduate and three one-term graduate courses may be permitted, upon recommendation of the advisor and with the approval of the co-ordinating committee, to transfer into the PhD program without completing an MSc thesis.

An average of at least 70% must be obtained in the required courses. A minimum grade of 65% is required for a pass in each course. No more than two courses, of the first four taken, can have a grade of less than 70%. If a student does not meet these minimum grade requirements, or receives a failing grade in any course, he/she may be required to withdraw from the program.

## Course Work and Major Research Project (MRP)

Eight one-term courses (0.50 unit weight) acceptable for graduate credit, including a project course summarized in a report, are required. The project must be approved by the candidate's advisor and the report read and approved by the advisor and one other faculty member. [Exception: biophysics students taking the course-based MSc option are required to take only one of the core courses PHYS\*7010, PHYS\*7030, PHYS\*7040, PHYS\*7060, PHYS\*7670, and PHYS\*7810]. Two of the courses may be undergraduate courses approved by the advisor and the Graduate Advisory Committee. If they are Physics courses, they must be at the fourth year level. This program is recommended for those planning careers requiring a broad non-specialized knowledge of physics (for example, high school teaching).

## PhD Program

The PhD program is research-based and offered in the fields of: 1) astrophysics and gravitation; 2) atomic, molecular and optical physics; 3) biophysics; 4) chemical physics; 5) condensed matter and material physics; 6) industrial and applied physics; 7) subatomic physics; and 8) quantum computing.

## Admission Requirements

A MSc degree in physics from an approved university or college with at least a B standing (75%) is normally required for entrance into the PhD program. Other requirements are the same as those described above for the MSc program (see web-site <http://gwp.on.ca/>).

## Degree Requirements

Four one-term courses not including any already taken for MSc credit are required; courses taken during the MSc program and in excess of those required will, however, be allowed for PhD credit. The extra courses must be identified prior to admission. The core courses for the program are Quantum Mechanics 1 (PHYS\*7010), Introduction to Quantum Field Theory (PHYS\*7030), Statistical Physics 1 (PHYS\*7040), Electromagnetic Theory (PHYS\*7060), Introduction to Quantum Information Processing (PHYS\*7670), and Fundamentals of Astrophysics (PHYS\*7810). By the end of the first year of the program, three of the core courses, including one of Quantum Mechanics 1 (PHYS\*7010), Statistical Physics 1 (PHYS\*7040) and Electromagnetic Theory (PHYS\*7060) or their equivalent should be completed. (Exception: Biophysics students must have taken at least one of Quantum Mechanics 1 (PHYS\*7010), Statistical Physics 1 (PHYS\*7040), and Electromagnetic Theory (PHYS\*7060) by the completion of the first year of the PhD program.) One of the required courses may be an undergraduate course outside the student's main field of study and must be approved by the student's advisory committee and the Graduate Program Coordinator. No undergraduate course in physics may be taken for credit.

An average of at least 70% must be obtained in the required courses. A minimum grade of 65% is required for a pass in each course. No more than two courses, of the first four taken, can have a grade of less than 70%. If a student does not meet these minimum grade requirements, or receives a failing grade in any course, he/she may be required to withdraw from the program.

PhD candidates are required to pass a Qualifying Examination normally during the first year of the program; in any case, it must be passed no later than the fifth semester in which he/she is enrolled. This is an oral examination of approximately two hours' duration before a committee that includes representation from the student's advisory committee. It is designed to test the student's knowledge of the fundamentals and applications of physics closely related to the thesis topic. An assessment of the student's ability in research will be a factor in determining the examination result. If a student has not passed the Qualifying Examination by the end of the fifth semester in which they are enrolled, he/she may be required to withdraw from the program.

PhD students must meet their advisory committee members at least once a year to present a written and oral report on their progress. Candidates must present a thesis embodying the results of original research conducted by them on an advanced topic. The thesis is defended before a committee which may also examine the student's knowledge of related material.

## Interdepartmental Programs

### Biophysics Interdepartmental Group

The Department of Physics participates in the MSc/PhD programs in biophysics. Please consult the Biophysics listing for a detailed description of the graduate programs offered by the Biophysics Interdepartmental Group.

## Courses

\* Courses offered annually. Other courses are offered on an alternate year basis and as requested.

### Perimeter Scholars' Institute Courses

#### PHYS\*6010 PSI Quantum Field Theory I U [0.50]

Canonical quantization of fields, perturbation theory, derivation of Feynman diagrams, applications in particle and condensed matter theory, renormalization in  $\phi^4$ .

*Department(s):* Department of Physics

#### PHYS\*6020 PSI Statistical Physics U [0.50]

A brief review of ensembles and quantum gases, Ising model, Landau theory of phase transitions, order parameters, topology, classical solutions.

*Department(s):* Department of Physics

#### PHYS\*6030 PSI Quantum Field Theory II U [0.50]

Feynman Path Integral, abelian and nonabelian gauge theories and their quantization, spontaneous symmetry breaking, nonperturbative techniques: lattice field theory, Wilsonian renormalization.

*Department(s):* Department of Physics

#### PHYS\*6040 PSI Relativity U [0.50]

Special relativity, foundations of general relativity, Riemannian geometry, Einstein's equations, FRW and Schwarzschild geometries and their properties.

*Department(s):* Department of Physics

#### PHYS\*6050 PSI Quantum Theory U [0.50]

Schrodinger equation: free particle, harmonic oscillator, simple time-dependent problems, Heisenberg picture and connection with classical physics. Entanglement and non-locality. Pure and mixed states, quantum correlators, measurement theory and interpretation.

*Department(s):* Department of Physics

#### PHYS\*6060 PSI Information and Data Analysis U [0.50]

Probability, entropy, Bayesian inference and information theory. Maximum likelihood methods, common probability distributions, applications to real data including Monte Carlo methods.

*Department(s):* Department of Physics

#### PHYS\*6070 PSI Dynamical Systems U [0.50]

Maps, flows, stability, fixed points, attractors, chaos, bifurcations, ergodicity, approach to chaos. Hamiltonian systems, Liouville, measure, Poincaré theorem, integrable systems with examples.

*Department(s):* Department of Physics

#### PHYS\*6080 PSI Computation U [0.50]

Common algorithms for ode and pde solving, with numerical analysis. Common tasks in linear algebra. Focus on how to write a good code, test it, and obtain a reliable result. Parallel programming.

*Department(s):* Department of Physics

#### PHYS\*6210 PSI Cosmology U [0.25]

FRW metric, Hubble expansion, dark energy, dark matter, CMB, Thermodynamic history of early universe. Growth of perturbations, CDM model of structure formation and comparison to observations, cosmic microwave background anisotropies, inflation and observational tests.

*Department(s):* Department of Physics

#### PHYS\*6220 PSI Standard Model U [0.25]

Application of Yang-Mills theory to particle physics, QCD and its tests in the perturbative regime, theory of weak interactions, precision tests of electroweak theory, CKM matrix and flavour physics, open questions.

*Department(s):* Department of Physics

#### PHYS\*6230 PSI String Theory U [0.25]

Superstring spectrum in 10d Minkowski, as well as simple toroidal and orbifold compactifications. T-duality, D-branes, tree amplitudes. Construct some simple unified models of particle physics. Motivate the 10- 11-dimensional supergravities. Simple supergravity solutions and use these to explore some aspects of AdS/CFT duality.

*Department(s):* Department of Physics

#### PHYS\*6240 PSI Mathematical Physics Topics U [0.25]

Differential forms, de Rham cohomology, differential topology and characteristic classes, monopoles and instantons, Kahler manifolds, Dirac equations, zero modes and index theorems.

*Department(s):* Department of Physics

#### PHYS\*6350 PSI Quantum Information Review U [0.25]

Review of selected topics in Quantum Information.

*Department(s):* Department of Physics

#### PHYS\*6360 PSI Gravitational Physics Review U [0.25]

Review of selected topics in Gravitational Physics.

*Department(s):* Department of Physics

#### PHYS\*6370 PSI Condensed Matter Theory U [0.25]

Review of selected topics in Condensed Matter Theory.

*Department(s):* Department of Physics

**PHYS\*6380 PSI Quantum Gravity U [0.25]**

Review of selected topics in Quantum Gravity.

*Department(s):* Department of Physics

**PHYS\*6390 PSI Foundations of Quantum Theory U [0.25]**

Review of selected topics in Foundations of Quantum Theory.

*Department(s):* Department of Physics

**PHYS\*6410 PSI Explorations in Quantum Information U [0.25]**

Review of selected topics in Quantum Information.

*Department(s):* Department of Physics

**PHYS\*6420 PSI Explorations in Gravitational Physics U [0.25]**

Review of selected topics in Gravitational Physics.

*Department(s):* Department of Physics

**PHYS\*6430 PSI Exploration in Condensed Matter Theory U [0.25]**

Review of selected topics in Condensed Matter Theory.

*Department(s):* Department of Physics

**PHYS\*6440 PSI Exploration in Quantum Gravity U [0.25]**

Review of selected topics in Quantum Gravity.

*Department(s):* Department of Physics

**PHYS\*6450 PSI Explorations in Foundations of Quantum Theory U [0.25]**

Review of selected topics in Foundations of Quantum Theory.

*Department(s):* Department of Physics

**PHYS\*6460 PSI Explorations in Particle Physics U [0.25]**

Review of selected topics in Particle Physics.

*Department(s):* Department of Physics

**PHYS\*6470 PSI Explorations in String Theory U [0.25]**

Review of selected topics in String Theory.

*Department(s):* Department of Physics

**PHYS\*6480 PSI Explorations in Complex Systems U [0.25]**

Review of selected topics in Complex Systems.

*Department(s):* Department of Physics

**PHYS\*6490 PSI Explorations in Cosmology U [0.25]**

Review of selected topics in Cosmology.

*Department(s):* Department of Physics

**Basic Group****PHYS\*7010 Quantum Mechanics I \* U [0.50]**

Review of formalism of nonrelativistic quantum mechanics including symmetries and invariance. Approximation methods and scattering theory. Elementary quantum theory of radiation. Introduction to one-particle relativistic wave equations.

*Department(s):* Department of Physics

**PHYS\*7020 Quantum Mechanics II U [0.50]**

Concepts of relativistic quantum mechanics, elementary quantum field theory, and Feynman diagrams. Application to many-particle systems.

*Prerequisite(s):* PHYS\*7010 or equivalent

*Department(s):* Department of Physics

**PHYS\*7040 Statistical Physics I\* U [0.50]**

Statistical basis of thermodynamics; microcanonical, canonical and grand canonical ensembles; quantum statistical mechanics, theory of the density matrix; fluctuations, noise, irreversible thermodynamics; transport theory; application to gases, liquids, solids.

*Department(s):* Department of Physics

**PHYS\*7050 Statistical Physics II U [0.50]**

Phase transitions. Fluctuation phenomena. Kubo's theory of time correlation functions for transport and spectral properties; applications selected from a variety of topics including linearized hydrodynamics of normal and superfluids, molecular liquids, liquid crystals, surface phenomena, theory of the dielectric constant, etc.

*Prerequisite(s):* PHYS\*7040 or equivalent.

*Department(s):* Department of Physics

**PHYS\*7060 Electromagnetic Theory \* U [0.50]**

Solutions to Maxwell's equations; radiation theory, normal modes; multipole expansion; Kirchhoff's diffraction theory; radiating point charge; optical theorem. Special relativity; transformation laws for the electromagnetic field; line broadening. Dispersion; Kramers-Kronig relations. Magnetohydrodynamics and plasmas.

*Department(s):* Department of Physics

**PHYS\*7080 Applications of Group Theory U [0.50]**

Introduction to group theory; symmetry, the group concept, representation theory, character theory. Applications to molecular vibrations, the solid state, quantum mechanics and crystal field theory.

*Department(s):* Department of Physics

**PHYS\*7670 Introduction to Quantum Information Processing F [0.50]**

Quantum superposition, interference, and entanglement. Postulates of Quantum Mechanics. Quantum computational complexity. Quantum Algorithms. Quantum communication and cryptography. Quantum error correction. Implementations.

*Department(s):* Department of Physics

**Subatomic and Nuclear****PHYS\*7030 Quantum Field Theory U [0.50]**

Review of relativistic quantum mechanics and classical field theory. Quantization of free quantum fields (the particle interpretation of field quanta). Canonical quantization of interacting fields (Feynman rules). Application of the formalism of interacting quantum fields to lowest-order quantum electrodynamic processes. Radiative corrections and renormalization.

*Prerequisite(s):* PHYS\*7010 or equivalent.

*Department(s):* Department of Physics

**PHYS\*7090 Green's Function Method U [0.50]**

Review of essential quantum field theory. Zero and finite temperature. Green's functions. Applications.

*Department(s):* Department of Physics

**PHYS\*7150 Nuclear Physics U [0.50]**

Static properties of nuclei; alpha, beta, gamma decay; two-body systems; nuclear forces; nuclear reactions; single-particle models for spherical and deformed nuclei; shell, collective, interacting boson models.

*Department(s):* Department of Physics

**PHYS\*7160 Special Topics in Subatomic and Nuclear Physics U [0.50]**

*Restriction(s):* Instructor consent required.

*Department(s):* Department of Physics

**PHYS\*7170 Intermediate and High Energy Physics U [0.50]**

Strong, electromagnetic and weak interactions. Isospin, strangeness, conservation laws and symmetry principles. Leptons, hadrons, quarks and their classification, formation, interactions and decay.

*Department(s):* Department of Physics

**PHYS\*7180 Special Topics in Subatomic and Nuclear Physics U [0.25]**

*Restriction(s):* Instructor consent required.

*Department(s):* Department of Physics

**Astronomy and Astrophysics****PHYS\*7810 Fundamentals of Astrophysics U [0.50]**

The fundamental astronomical data: techniques to obtain it and the shortcomings present. The classification systems. Wide- and narrow-band photometric systems. The intrinsic properties of stars: colours, luminosities, masses, radii, temperatures. Variable stars. Distance indicators. Interstellar reddening. Related topics.

*Department(s):* Department of Physics

**PHYS\*7840 Advanced General Relativity W [0.50]**

Review of elementary general relativity. Timelike and null geodesic congruences. Hypersurfaces and junction conditions. Lagrangian and Hamiltonian formulations of general relativity. Mass and angular momentum of a gravitating body. The laws of black-hole mechanics.

*Department(s):* Department of Physics

**PHYS\*7850 Quantum Field Theory for Cosmology U [0.50]**

Introduction to scalar field theory and its canonical quantization in flat and curved spacetimes. The flat space effects of Casimir and Unruh. Quantum fluctuations of scalar fields and of the metric on curved space-times and application to inflationary cosmology. Hawking radiation.

*Prerequisite(s):* PHYS\*7010

*Department(s):* Department of Physics

**PHYS\*7860 General Relativity for Cosmology U [0.50]**

Introduction to the differential geometry of Lorentzian manifolds. The principles of general relativity. Causal structure and cosmological singularities. Cosmological space-times with Killing vector fields. Friedmann-Lemaître cosmologies, scalar vector and tensor perturbations in the linear and nonlinear regimes. De Sitter space-times and inflationary models.

*Department(s):* Department of Physics

**PHYS\*7870 Cosmology U [0.50]**

Friedmann-Robertson-Walker metric and dynamics; big bang thermodynamics; nucleosynthesis; recombination; perturbation theory and structure formation; anisotropies in the Cosmic Microwave Background; statistics of cosmological density and velocity fields; galaxy formation; inflation.

*Department(s):* Department of Physics

**PHYS\*7880 Special Topics in Astronomy U [0.50]**

Offered on demand

*Department(s):* Department of Physics

**PHYS\*7890 Special Topics in Astrophysics U [0.25]**

Offered on demand

*Department(s):* Department of Physics

**PHYS\*7900 Special Topics in Gravitation and Cosmology U [0.50]**

*Department(s):* Department of Physics

**PHYS\*7910 Special Topics in Gravitation and Cosmology U [0.25]**

*Department(s):* Department of Physics

**Atomic and Molecular****PHYS\*7100 Atomic Physics U [0.50]**

Emphasis on atomic structure and spectroscopy. Review of angular momentum, rotations, Wigner-Eckart theorem, n-j symbols. Energy levels in complex atoms, Hartree-Fock theory, radiative-transitions and inner-shell processes. Further topics selected with class interest in mind, at least one of which is to be taken from current literature.

*Department(s):* Department of Physics

**PHYS\*7130 Molecular Physics U [0.50]**

Angular momentum and the rotation of molecules; introduction to group theory with application to molecular vibrations; principles of molecular spectroscopy; spectra of isolated molecules; intermolecular interactions and their effects on molecular spectra; selected additional topics (e.g., electronic structure of molecules, experimental spectroscopic techniques, neutron scattering, correlation functions, collision induced absorption, extension of group theory to molecular crystals, normal co-ordinate analysis, etc.).

*Department(s):* Department of Physics

**Condensed Matter****PHYS\*7310 Solid State Physics I U [0.50]**

Phonons, electron states, electron-electron interaction, electron-ion interaction, static properties of solids.

*Department(s):* Department of Physics

**PHYS\*7320 Solid State Physics II U [0.50]**

Transport properties; optical properties; magnetism; superconductivity; disordered systems.

*Department(s):* Department of Physics

**PHYS\*7330 Special Topics in Theoretical Condensed Matter Physics U [0.50]**

*Department(s):* Department of Physics

**PHYS\*7370 Special Topics in Surface Physics U [0.50]**

*Department(s):* Department of Physics

**Biophysics****PHYS\*7510 Clinical Applications of Physics in Medicine U [0.50]**

This course provides an overview of the application of physics to medicine. The physical concepts underlying the diagnosis and treatment of disease will be explored. Topics will include general imaging principles such as resolution, intensity, and contrast; x-ray imaging and computed tomography; radioisotopes and nuclear medicine, SPECT and PET; magnetic resonance imaging; ultrasound imaging and radiation therapy. Credit may be obtained for only one of PHYS\*4070 or PHYS\*7510.

*Department(s):* Department of Physics

**PHYS\*7520 Molecular Biophysics U [0.50]**

Physical methods of determining macromolecular structure: energetics, intramolecular and intermolecular forces, with application to lamellar structures, information storage, DNA and RNA, recognition and rejection of foreign molecules. Offered in conjunction with PHYS\*4540. Extra work is required of graduate students.

*Restriction(s):* Credit may be obtained for only one of PHYS\*4540 or PHYS\*7520

*Department(s):* Department of Physics

**PHYS\*7540 Special Topics in Biophysics U [0.50]**

Offered on demand

*Department(s):* Department of Physics

**PHYS\*7570 Special Topics in Biophysics U [0.25]**

Offered on demand

*Department(s):* Department of Physics

**Applied Physics (including Technical Methods)****PHYS\*7140 Nonlinear Optics U [0.50]**

Classical and Quantum Mechanical descriptions of nonlinear susceptibility, nonlinear wave propagation, nonlinear effects such as Peckel's and Kerr effects, harmonic generation, phase conjugation and stimulated scattering processes.

*Department(s):* Department of Physics

**PHYS\*7450 Special Topics in Experimental Physics \* U [0.50]**

A modular course in which each module deals with an established technique of experimental physics. Four modules will be offered during the Winter and Spring semesters, but registration and credit will be in the spring semester. Typical topics are neutron diffraction, light scattering, acoustics, molecular beams, NMR, surface analysis, etc.

*Department(s):* Department of Physics

**PHYS\*7470 Optical Electronics U [0.50]**

Optoelectronic component fabrication, light propagation in linear and nonlinear media, optical fiber properties, electro-optic and acousto-optic modulation, spontaneous and stimulated emission, semiconductor lasers and detectors, noise effects in fiber systems.

*Department(s):* Department of Physics

**Special Courses (offered on demand only)****PHYS\*7120 Special Topics in Theoretical Physics U [0.50]**

*Department(s):* Department of Physics

**PHYS\*7710 Special Lecture and Reading Course U [0.50]**

*Department(s):* Department of Physics

**PHYS\*7730 Special Topics in Physics U [0.50]**

*Department(s):* Department of Physics

**PHYS\*7750 Interinstitution Exchange U [0.50]**

At the GWPI director's discretion, a PhD or MSc student may receive credit for a term of specialized studies at another institution. Formal evaluation is required.

*Restriction(s):* GWPI director approval required

*Department(s):* Department of Physics

**PHYS\*7970 MSc Project U [1.00]**

Study of a selected topic in physics presented in the form of a written report. For students whose MSc program consists entirely of courses

*Department(s):* Department of Physics

## Plant Agriculture

The MSc and PhD programs in the Department of Plant Agriculture offer specialization in four broad fields of the Plant Sciences: 1) plant breeding and genetics; 2) plant biochemistry and physiology; 3) crop production systems and 4) bioproducts.

- **Plant Breeding and Genetics** has long been a key focus of our faculty and students. Through breeding and biotechnology, Guelph researchers help society by developing new field-crop, fruit, ornamental and vegetable cultivars that are grown in Canada and worldwide. Also, Plant Agriculture faculty and students seek both to understand the fundamental mechanisms that enable plant improvements and to discover novel methodologies and technologies that will be the foundation for future advances.
- **Plant Biochemistry and Physiology** is a broad discipline. Faculty and students in this area study the response of plants to environmental change and plant development at the ecosystem, whole plant, and molecular levels. Students investigate ecologically friendly management strategies, study underlying molecular and biochemical mechanisms that regulate plant development, investigate how plant performance can be optimized in the field or closed environments, and contribute to cultivar development
- **Crop Production Systems** research seeks to develop or test agricultural management strategies for yield improvement and economically and environmentally sound production practices in field and horticultural crops such as ornamentals and turf. Students assist producers and industry in the control of weeds, insects and plant diseases, and investigate new management protocols for production of high quality crops.
- **Bioproducts** is a multi-disciplinary field and will deal with background sciences ranging from chemical engineering to plant science. Students deal with products and materials made from cellulose, oil, protein, starch and other compounds derived from various plant parts such as seeds, stalks/stovers, hulls and cobs of crop plants. Students will develop their expertise in analytical methods, factors affecting quality of plant-derived raw materials, engineering (including bioengineering of bioproducts) biomaterials and biocomposites.

## Administrative Staff

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## Graduate Faculty

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### William Deen

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### Hugh J. Earl

BSc, MSc Guelph, PhD Western Ontario - Associate Professor and Chair

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### Christopher L. Gillard

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### Bernard Grodzinski

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### Lewis N. Lukens

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### Eric M. Lyons

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### Ralph C. Martin

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### Mary Ruth McDonald

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### Barry J. Micallef

BSc, MSc Guelph, PhD Wisconsin-Madison - Associate Professor and Associate Department Chair

### Amar K. Mohanty

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### Alireza Navabi

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### Gopinadhan Paliyath

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### K. Peter Pauls

BSc, MSc, PhD Waterloo - Professor

### Manish N. Raizada

BSc Western, PhD Stanford - Professor

### Istvan Rajcan

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### Darren E. Robinson

BSc Winnipeg, MSc Manitoba, PhD Guelph - Associate Professor

### Praveen K. Saxena

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### Arthur W. Schaafsma

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### Peter H. Sikkema

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### J. Alan Sullivan

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### Rene C. Van Acker

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### David J. Wolyn

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## Associated Graduate Faculty

### Michael Brownbridge

BSc, PhD Newcastle Upon Tyne - Research Director, Horticulture Production Systems, Vineland Research and Innovation Centre

### Adam Dale

BSc, PhD Sheffield - Retired Faculty

### Gavin Humphreys

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### Laima Kott

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### Qiang Liu

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### Sean Myles

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### Steven Schnebly

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### Barry Shelp

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### Ting Zhou

BSc Henan, PhD McGill - Research Scientist, Agriculture & Agri-Food Canada

## MSc Program

The Department of Plant Agriculture offers an MSc program in four broad fields of the Plant Sciences: 1) plant breeding and genetics; 2) plant biochemistry and physiology; 3) crop production systems and 4) bioproducts. Students conduct basic and/or applied research on topics within these fields.

## Admission Requirements

Applicants should have a baccalaureate degree in an honours plant science/biology program, or the equivalent, from a recognized university or college with an average academic standing of at least 'B' during the last two years of full-time study (or equivalent). To assist in identifying a suitable thesis advisor(s), applicants should submit a short statement of research interests. Supportive letters of reference are essential and should outline the applicant's strengths and weaknesses. Students may be admitted in the Fall, Winter or Summer semesters. The University of Guelph requires that applicants from some foreign institutions have a MSc (or equivalent) degree before they are considered for admission to the University of Guelph's MSc program.

## Degree Requirements

A program of prescribed courses (at least 1.50 credits of 6000 level courses) and additional courses is established with the student's advisory committee. All MSc candidates must complete a thesis and present a seminar in conjunction with the final oral examination. Students are required to participate in the Seminar PLNT\*6400 and in a Departmental Colloquium course dealing with current topics. Students are expected to participate in Departmental events, with particular emphasis on seminar series.

## PhD Program

The Department of Plant Agriculture offers a PhD program in four broad fields of the Plant Sciences: 1) plant breeding and genetics; 2) plant biochemistry and physiology; 3) crop production systems and 4) bioproducts. Students conduct research on topics within these fields.

## Admission Requirements

The usual requirement for admission into the PhD program is a MSc degree by thesis in a field appropriate to their proposed area of specialization with a minimum 'B' average and supportive letters of reference. Direct admission to the PhD program is permitted to applicants holding an honours baccalaureate degree and demonstrating extraordinary academic and research capabilities. It is also possible for a student to transfer from the MSc without completing the requirements for that degree if the student has an excellent academic record and has strong research progress that can be expanded to the doctoral level. The request for transfer must be initiated by the student and must be done no earlier than the end of the second semester and no later than the end of the fourth semester. Applicants should submit a statement of research interests, background experiences, and career goals to assist in the identification of an appropriate faculty adviser with the resources necessary to support the thesis research. Students may be admitted in the Fall, Winter or Spring semesters. In some instances, applicants who already hold a MSc may be required to initially register in the MSc program.

## Degree Requirements

The major emphasis in the PhD program is on research and the preparation and defense of an acceptable thesis. All PhD candidates must complete a thesis and present a seminar in conjunction with the final oral examination. Students are required to participate in the Seminar PLNT\*6400 and in a Departmental Colloquium course dealing with current topics. There are no other specific course requirements. It is usual for most students, in consultation with their advisory committee, to select some appropriate courses in preparation for the qualifying examination and thesis research. The qualifying examination is in two parts (written and oral) and evaluates the student's knowledge of their field of specialization and related topics. The qualifying examination is taken no later than the fifth semester. For students who have transferred from the MSc program or have been admitted directly to the PhD program from a BSc, the qualifying examination is taken no later than the seventh semester. The advisory committee is required to submit a written evaluation of the student's performance in research and the student's potential as a researcher. Upon completion of the qualifying examination, the student becomes a candidate for the PhD degree.

All students are expected to participate in Departmental events, with particular emphasis on seminar series.

## Interdepartmental Programs

### Bioinformatics MBNF

The Department of Plant Agriculture participates in the Master of Bioinformatics Program. Please consult the Bioinformatics listing for a detailed description of the Master of Bioinformatics

## Collaborative Specializations

### International Development Studies

The Department of Plant Agriculture participates in the PhD collaborative specialization in International Development Studies (IDS). Please consult the International Development Studies listing for a detailed description of the PhD collaborative specialization.

### Toxicology

The Department of Plant Agriculture participates in the MSc/PhD collaborative specialization in toxicology. Please consult the Toxicology listing for a detailed description of the MSc/PhD collaborative specialization.

## Courses

### Plant Breeding and Genetics

#### PLNT\*6100 Advanced Plant Breeding I W [0.50]

The practical consideration of genetic theory and biological limitations to improving plant populations and developing cultivars are discussed. Current and emerging breeding methodologies and sources of variation used to achieve plant breeding goals are examined through lectures, paper discussion, site visits and invited talks.

*Department(s):* Department of Plant Agriculture

#### PLNT\*6160 Advanced Plant Breeding II W [0.50]

Fundamentals of quantitative genetics. Topics include gene and genotype frequencies means, variances, covariances and resemblance among relatives. Lecture topics are expanded through discussion of classic and current papers.

*Offering(s):* Offered in odd-numbered years.

*Department(s):* Department of Plant Agriculture

#### PLNT\*6250 Colloquium in Plant Genetics and Breeding U [0.25]

An open discussion course designed to review and critically analyse contemporary issues in plant genetics and breeding.

*Department(s):* Department of Plant Agriculture

#### PLNT\*6260 Advanced Plant Genetics I F [0.50]

A lecture and discussion course examining the underlying principles of genetics and the recent advances in plant genetics. Topics include: structure of the genome, experiments to measure and experimentally describe phenotypes, population structures, and molecular basis of inheritance of a phenotype.

*Department(s):* Department of Plant Agriculture

#### PLNT\*6290 Physiological and Developmental Genetics in Plants F [0.50]

A lecture and discussion course examining classical and molecular genetic investigations to understand the genetic basis and regulation of physiological and developmental processes in plants.

*Offering(s):* Offered in even-numbered years.

*Department(s):* Department of Plant Agriculture

#### PLNT\*6340 Plant Breeding F [0.50]

This course examines principles of plant breeding in self- and cross-pollinated crops. Additional topics include crop domestication, mating systems, heritability, gain from selection, disease resistance, polyploidy, marker assisted selection and government regulations.

*Restriction(s):* MBG\*4160

*Department(s):* Department of Plant Agriculture

#### PLNT\*6500 Applied Bioinformatics W [0.50]

The goal of this course is to provide an introductory understanding of the databases and methods used in computational molecular biology research. Topics include: reviewing major molecular databases and their structures, constructing sequence alignments, constructing phylogenies, and finding motifs and genes in biological sequences. Lab sessions include an introduction to Unix and Perl for the biologist and hands-on use of several molecular data analysis programs.

*Prerequisite(s):* Undergraduate level statistics class (such as STAT\*2040 or STAT\*2100) and undergraduate level molecular biology class (such as MBG\*2020).

*Department(s):* Department of Plant Agriculture

### Plant Biochemistry and Physiology

#### PLNT\*6010 Physiology of Crop Yield W [0.50]

This course covers factors affecting biomass production and yield, with primary focus on phenomena measured at the whole canopy scale. Yield-limiting abiotic stresses (temperature, water deficit, nutrient deficiency) are considered in detail, as are technical aspects of instrumentation used in crop physiology research. (Offered annually)

*Prerequisite(s):* PBIO\*3110 or permission of instructor

*Department(s):* Department of Plant Agriculture

#### PLNT\*6110 Fruit and Vegetable Technology F [0.50]

The course is primarily intended to address science and technology aspects of fruits and vegetables, with specific reference to storage, packaging, quality, processing, products and ingredients, health regulatory properties and biotechnology issues. Methods of instruction include lectures and seminars. Students are evaluated during their seminar presentations, term papers and participation in discussions.

*Offering(s):* Offered in even-numbered years.

*Department(s):* Department of Plant Agriculture

**PLNT\*6230 Colloquium in Plant Physiology and Biochemistry U [0.25]**

An open discussion course designed to review and critically analyze contemporary issues in plant physiology and biochemistry.

*Department(s):* Department of Plant Agriculture

**PLNT\*6320 Metabolic Processes in Crop Plants F [0.50]**

A comprehensive examination of the metabolic mechanisms and versatility whereby autotrophic organisms sustain themselves. Emphasis is placed on our current understanding of the regulation and integration of metabolic processes in plants and their physiological and agricultural significance including available research methodologies.

*Prerequisite(s):* one undergraduate course in biochemistry

*Restriction(s):* No auditing without permission of Instructor.

*Department(s):* Department of Plant Agriculture

**PLNT\*6330 Metabolism of Natural Products in Plants W [0.50]**

A comprehensive analysis of the metabolism and roles of natural products in plants. Emphasis is placed on the distinction between secondary and primary processes, and the composition, detection, and regulation of the biosynthesis, modification and turnover of natural products. Key research methodologies and the roles of natural products in abiotic and biotic stresses and their effects on human health are discussed.

*Offering(s):* Offered in even-numbered years.

*Department(s):* Department of Plant Agriculture

**Crop Production Systems****PLNT\*6210 Herbicide Activity, Modes-of-Action, Selectivity and Resistance F [0.50]**

This course provides a comprehensive study of the major herbicide groups. The various herbicide groups will be discussed under the following topics: herbicide uptake and translocation, herbicide mode of action, herbicide selectivity, weeds controlled and crop injury.

*Offering(s):* Offered in odd-numbered years.

*Department(s):* Department of Plant Agriculture

**PLNT\*6240 Colloquium in Crop Production and Management U [0.25]**

An open discussion course designed to review and critically analyze contemporary issues in crop production and management.

*Department(s):* Department of Plant Agriculture

**PLNT\*6270 Agroecosystem Design and Function F [0.50]**

This lecture-based course critically analyzes the agroecosystem in field crop, horticulture, turfgrass and greenhouse industries. Agroecosystem design is considered in relation to key components such as crop rotation and management of soil, nutrient and water supply. The significance of plant function, soil properties, and nutrient and water cycles to agroecosystem design are examined. Metrics of productivity and environmental sustainability serve to focus discussion on agroecosystem optimization.

*Department(s):* Department of Plant Agriculture

**PLNT\*6280 Invasive Plant Ecology in Natural and Agricultural Systems W [0.50]**

This course focuses on the ecological principles that are important in understanding the potential for a plant species to become invasive. Students are able to use this knowledge to facilitate management of these species under field conditions.

*Offering(s):* Offered in odd-numbered years.

*Prerequisite(s):* CROP\*4240 or BOT\*2100 or BOT\*3120

*Department(s):* Department of Plant Agriculture

**General****PLNT\*6080 Plant Disease Epidemiology and Management F [0.50]**

Epidemiology and management of plant diseases caused by fungi, viruses, and bacteria.

*Offering(s):* Offered in even-numbered years.

*Department(s):* Department of Plant Agriculture

**PLNT\*6170 Statistics in Plant Agriculture W [0.50]**

The application of statistical techniques to research in plant agriculture. SAS is the software used to perform data analysis. Emphasis is placed on statistical principles, the design of experiments, the testing of hypotheses, and communication of findings to other scientists.

*Department(s):* Department of Plant Agriculture

**PLNT\*6400 Seminar F,W [0.25]**

All graduate students present a departmental seminar on their research proposal in their second or third semester. Each student is expected to participate in the seminars of colleagues and faculty.

*Restriction(s):* Restricted to thesis-based students

*Department(s):* Department of Plant Agriculture

**PLNT\*6450 Plant Agriculture International Field Tour U [0.25]**

A field course designed to increase student's knowledge of primary field and animal agricultural production systems, to explore the environmental and political issues related to international agriculture, and to understand the role of agri-business in the rural economy.

*Restriction(s):* CROP\*4260 if PLNT\*6450 is field tour to mid-west USA

*Department(s):* Department of Plant Agriculture

**PLNT\*6800 Special Topics in Plant Science U [0.50]**

A study of selected contemporary topics in plant science. Proposed course descriptions are considered by the Department of Plant Agriculture on an ad hoc basis, and the course is offered according to demand.

*Department(s):* Department of Plant Agriculture

## Political Science

The Department of Political Science offers MA and PhD programs in two main fields:

- Public Policy and Governance
- Comparative Politics

Faculty members' research and supervisory expertise is further concentrated in, but not limited to, the following thematic areas: social policy; environmental policy; international trade policy; criminal justice policy; politics of development; and women, gender and politics.

### Administrative Staff

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BA UBC, MA, PhD Toronto - Assistant Professor

#### Kate Puddister

BA, MA Guelph, PhD McGill - Assistant Professor

#### Troy Riddell

BA, MA Calgary, PhD McGill - Associate Professor

#### Byron M. Sheldrick

BA Carleton, LLB Toronto, MA, PhD York - Associate Professor

#### Julie Simmons

BA British Columbia, MA, PhD Toronto - Assistant Professor

#### Tamara Small

BA Guelph, MA Calgary, PhD Queen's - Assistant Professor and Graduate Program Coordinator

#### Ian S. Spears

BA Toronto, MA Queen's, PhD McGill - Associate Professor

#### Adam Sneyd

BA Queen's, MA York, PhD McMaster - Assistant Professor

### MA Program

The MA program offers students the opportunity to pursue studies in two fields: 1) comparative politics (industrial and third world/international development); and 2) public policy and governance. Graduate students choose one of the following options: MA by course-work; MA by thesis; or MA Guelph-McMaster in Public Policy and Administration

The program's structure and the diverse interests of its members have resulted in a very broad range of course offerings. Graduates are engaged in a wide range of careers in academia, government and industry.

### Application Procedure

Program offices should be consulted for admission deadlines and required documents <https://www.uoguelph.ca/polisci/masters/how-apply> . Complete application submission instructions can be found at <http://www.uoguelph.ca/graduatestudies/apply>

Graduate students are admitted each Fall semester.

### Admission Requirements

The department requires an Honours BA degree (4 years) in political science (or its equivalent) with at least a 'B+' average for consideration for admission to the program. A methodology course equivalent to The Systematic Study of Politics, POLS\*3650, in the Department of Political Science undergraduate program, is necessary for admission to the graduate program. Students not satisfying this requirement may be admitted with the provision that it be satisfied by completing the requisite extra course.

### Degree Requirements

Students enrol in one of two study options: 1) thesis, or 2) course work and major research paper.

#### Thesis

In order to satisfy the degree requirements, students will complete five courses plus a Pro-Seminar and a thesis, as described below for a total of 2.75 credits.

One professional development and orientation course:

POLS\*6900 [0.25] Pro-Seminar

One methodology course:

POLS\*6940 [0.50] Qualitative Research Design and Methods  
or an appropriate equivalent from another department.

One core course:

POLS\*6000 [0.50] Comparative Approaches to Political Science

Three departmental courses or, in consultation with the graduate advisor, courses outside the department.

With the permission of the Graduate Program Coordinator, complete and successfully defend a thesis of no more than 20,000 words.

#### Course Work and Major Research Paper (MRP)

In order to satisfy the degree requirements, the student will complete six courses plus a Pro-Seminar and two course equivalents of major paper research, as described below, for a total of 4.25 credits.

One professional development and orientation course:

POLS\*6900 [0.25] Pro-Seminar

One methodology course:

POLS\*6940 [0.50] Qualitative Research Design and Methods  
or an approved equivalent from another department.

One core course:

POLS\*6000 [0.50] Comparative Approaches to Political Science

Four departmental courses or, in consultation with the graduate advisor, courses outside the department .

With the permission of the Graduate Program Coordinator, graduate students complete and successfully defend a Major Research Paper of approximately 10,000 words.

POLS\*6970 [1.00] Major Paper

### MA - Guelph-McMaster Collaborative; MA - Public Policy and Administration Option

The collaborative public policy and administration option is an initiative on the part of the Departments of Political Science at the University of Guelph and McMaster University to co-ordinate their involvement in this particular area.

The option successfully melds policy studies and administrative studies into a unique study option in Canada. Students can avail themselves of core courses that may be offered at either institution. Up to 50% of courses can be taken at each university. The option is one year in length. All the courses are grounded within the discipline of political science, while giving attention and regard to the contribution of related disciplines - such as economics, law and sociology.

Graduates enjoy successful careers in the public services of Canada, Ontario and other provinces, as well as local governments, and pursue careers in the private sector as well as the non-profit sector. A number of graduates have pursued PhDs and now teach in universities and colleges.

#### Course of Study

The Fall and Winter semesters are devoted to completing the course requirements: four core courses and two specialized electives. The Summer semester differs for students who are formally enrolled at Guelph and those formally enrolled at McMaster.

### Degree Requirements

In order to satisfy the degree requirements, the student will complete six courses plus a Pro-Seminar and two course equivalents of major paper research as described below for a total of 4.25 credits.

One professional development and orientation course:

POLS*6900	[0.25]	Pro-Seminar
One methodology course:		
POLS*6940	[0.50]	Qualitative Research Design and Methods
Three core courses:		
POLS*6630	[0.50]	Approaches to Public Policy
POLS*6640	[0.50]	Canadian Public Administration: Public Sector Management
MCM*7940	[0.50]	Research Seminar: Public Policy
Two departmental courses offered at the University of Guelph or McMaster University. With the permission of the Graduate Program Committee, graduate students complete and successfully defend a Major Research Paper of approximately 10,000 words:		
POLS*6970	[1.00]	Major Paper

## PhD Program

The PhD program offers students the opportunity to pursue studies in two fields: 1) comparative politics; and 2) public policy and governance. Students are required to major in one field and minor in the other. Within comparative politics, students can focus their studies thematically or regionally. The department has expertise in developing, transitional, and advanced-industrial countries. Within the field of public policy and governance students can pursue studies in a wide range of areas, including health care, law, criminal justice, environmental policy, social policy, security policy, trade policy, federalism and intergovernmental relations, and multilevel governance.

## Application Procedure

Graduate students are admitted each Fall semester. Program offices should be consulted for admission deadlines and required documents <https://www.uoguelph.ca/polisci/masters/how-apply>. All applications must be submitted on-line. Complete application submission instructions can be found at <http://www.uoguelph.ca/graduatestudies/apply>

## Admission Requirements

Students are expected to have completed an MA in Political Science with at least an A-average for consideration for admission to the program. Students are also required to have successfully completed a graduate course in quantitative and qualitative Political Science methods. Students not satisfying this requirement may be admitted with the provision that it be satisfied by completing the requisite extra course. Students with a MA in a Social Science other than Political Science, are encouraged to apply on the condition that they take additional courses upon their entry into the program.

## Degree Requirements

Students will be required to successfully complete a minimum of four graduate courses:

- Two PhD core courses (see [Department's Graduate Handbook](#) in the student's major field and minor field (selected in consultation with the student's Advisor)
- Two of the following courses as electives:
  - i. One or two of the other existing graduate courses offered in the Department
  - ii. A graduate course offered in another department at the University of Guelph (selected in consultation with the student's Advisor).
- A written qualifying exam and an oral qualifying exam.

The qualifying examination will take the form of a written take-home examination followed by an oral examination and will be based on the reading lists for the core courses in the major and minor field. Normally the examination will involve three questions based on the major field of study and two questions from the minor field.

- A thesis

Each candidate will be required to write and submit a thesis on the research carried out by the candidate on a topic approved by the Advisory Committee. The thesis is expected to be a significant contribution to knowledge in its field and the candidate must indicate in what ways it is a contribution. A thesis is expected to be no less than 200 pages in length. The thesis must demonstrate mature scholarship and critical judgement on the part of the candidate, and it must indicate an ability to express oneself in a satisfactory literary style. Approval of the thesis is taken to imply that it is judged to be sufficiently meritorious to warrant publication in reputable scholarly media in the field.

## Collaborative Specializations

### International Development Studies

The Department of Political Science participates in the MA in International Development Studies (IDS) collaborative specialization. Please consult the International Development Studies listing for a detailed description of the MA collaborative specialization including the special additional requirements for each of the participating departments.

IDS graduates hold positions in government in Canada and abroad with NGOs, international organizations and private consultancies. Many also enter PhD programs.

The Department of Political Science also participates in the PhD collaborative specialization in International Development Studies (IDS), which provides an opportunity to engage in interdisciplinary study of international development issues. Applications are part of the general PhD application, and go directly to the Political Science Department. In addition to the Political Science PhD requirements, IDS applicants are expected to have a strong background in the social sciences, a demonstrable track record of experience in the course-based study of development issues, development research and/or development practice and a stated research interest relating to international development. The IDS designation also requires two core courses in international development theory and research methods. Please consult the International Development Studies listing for more information about the requirements and expectations of the PhD collaborative specialization in IDS.

## Courses

<b>POLS*6000 Comparative Approaches to Political Science U [0.50]</b>
In this course, the students examine the main theoretical frameworks and debates in political science and the ways in which these conceptual approaches guide empirical analysis and explain political behaviour. Examples include neo-institutionalism, political culture, Marxism, feminist and identity based approaches. <i>Department(s):</i> Department of Political Science
<b>POLS*6050 Gender and Politics U [0.50]</b>
This course will survey theoretical approaches to gender, primarily feminist analysis. Through selected readings, students will be introduced to gender as an approach to examining current political problems such as social policy, security or development. <i>Department(s):</i> Department of Political Science
<b>POLS*6210 Conceptions of Canada U [0.50]</b>
This course will explore evolving conceptions of Canadian identity and nationalism through consideration of political culture, institutions and constitutional arrangements. Possible topics include: multiculturalism, aboriginal identity and community, Quebec nationalism, social citizenship, rights and representation, as well as Canada's global role and significance. <i>Department(s):</i> Department of Political Science
<b>POLS*6250 Comparative Governments in the Americas U [0.50]</b>
This course provides the theoretical and methodological foundation for the analysis of Canada, the United States, and Latin America and the Caribbean. Methodological issues in the analysis of constitutional regimes and theoretical frameworks for the comparative analysis of political institutions are examined. <i>Department(s):</i> Department of Political Science
<b>POLS*6290 The American Political System U [0.50]</b>
This course examines the institutions, processes and policies of the government and politics of the United States. Seminar discussion focuses on evaluating approaches to the study of the American system. Topics to be covered include Congress, interest groups, executive-legislative relations and reinventing government. <i>Department(s):</i> Department of Political Science
<b>POLS*6380 Democratization in Comparative Perspective U [0.50]</b>
This course offers a graduate seminar in the study of democratization. Focusing primarily on the countries of the Global South, it explores theories of democratic transition, social mobilization and the articulation of rights aimed at defending new forms of democratic recognition. <i>Department(s):</i> Department of Political Science
<b>POLS*6390 Environmental Politics and Policy U [0.50]</b>
This course analyses environmental actors, movements, institutions, processes and policies across national, sub-national regional and/or global levels of governance utilizing a range of environmental perspectives and theories. Depending on the instructor(s), different case studies of critical and contemporary environmental policy issues will be explored. <i>Department(s):</i> Department of Political Science
<b>POLS*6400 Comparative Social Policy U [0.50]</b>
In this course, students will study social policy in comparative perspective. Theoretical models and various policy fields will be examined in order to understand welfare state development and retrenchment. Policy fields may include immigration, health, child care and income. <i>Department(s):</i> Department of Political Science
<b>POLS*6450 International Political Economy U [0.50]</b>
The course relies on theoretical approaches in IPE to examine the relationships between politics and economics across national and regional levels. The evolution of the global political economy and its globalization and state and non-state actors' responses. Issue areas may include: money and power, technology, trade, development and the environment. <i>Department(s):</i> Department of Political Science

**POLS\*6630 Approaches to Public Policy U [0.50]**

This course introduces students to the main theoretical approaches utilized in understanding public policy making and outcomes. Throughout the course, particular attention is paid to varying conceptions of institutions, ideas and interest and the role of these conceptions in various explanations of policy change and stasis.

*Department(s):* Department of Political Science

**POLS\*6640 Canadian Public Administration: Public Sector Management U [0.50]**

This course examines the growth of the administrative state in Canada, especially in the post World War II period. It critically reviews issues such as the concept of public sector management, the delegation of authority, personnel management, accountability and the ethics of ministers and officials to Parliament and the public.

*Department(s):* Department of Political Science

**POLS\*6730 The Politics of Development and Underdevelopment U [0.50]**

This course, for MA students specializing in international and comparative development, has a primarily theoretical orientation, focusing on the main paradigms that have evolved to explain central problems and issues of development and underdevelopment, particularly modernization theory, dependency theory, world-systems theory and Marxist state- theory.

*Department(s):* Department of Political Science

**POLS\*6750 Development in Practice U [0.50]**

This course examines the politics of international development policy and practice. Drawing upon theories of development and underdevelopment, it examines the role of transnational regimes, international institutions, national governments, and NGOs in the provision of international development assistance.

*Department(s):* Department of Political Science

**POLS\*6800 Public Policy and Governance - Selected Topics F [0.50]**

This course explores concepts, theories and methods of public policy analysis and governance practices and questions; the factors that influence a state's ability to design, coordinate, implement and learn from policy interventions; the intellectual forces and conceptual-theoretical frameworks that underpin the literature.

*Restriction(s):* Doctoral students only.

*Department(s):* Department of Political Science

**POLS\*6810 Core Seminar in Comparative Politics W [0.50]**

This PhD seminar course will familiarize students with themes and theorists in comparative politics.

*Restriction(s):* Doctoral students only.

*Department(s):* Department of Political Science

**POLS\*6900 Pro-Seminar U [0.25]**

This course is a 0.25 credit course introducing students to graduate studies in the department and to the profession of political science. It includes information on the following: formation of a student's faculty advisory committee; preparation of research proposals for thesis and major papers; library orientation; research using the WWW and computers; and discussion of faculty research. All graduate students are required to take this course. The course is graded satisfactory (SAT) or unsatisfactory (UNS).

*Department(s):* Department of Political Science

**POLS\*6940 Qualitative Research Design and Methods U [0.50]**

This course focuses on the elements of designing and writing a research question and proposal. It further examines a variety of research methods, such as the case study, comparative and survey methods. Data collection techniques also are examined.

*Department(s):* Department of Political Science

**POLS\*6950 Specialized Topics in Political Studies U [0.50]**

This course is intended to be an elective course for students wishing to pursue an area of investigation not covered in the other courses offered by the department. This course may also be chosen by students who want to further pursue a subject area to which they were introduced in a previous course.

*Department(s):* Department of Political Science

**POLS\*6960 Directed Readings U [0.50]**

This is an elective course for students wishing to pursue an area of investigation not covered in other courses offered by the department. This course may also be chosen by students who want to further pursue a subject area to which they were introduced in a previous course.

*Department(s):* Department of Political Science

**POLS\*6970 Major Paper U [1.00]**

The major paper is an extensive research paper for those who do not elect to complete a thesis. It may be taken over two semesters. The length of the major paper is not to exceed 10,000 words.

*Department(s):* Department of Political Science

Students should also consult the fourth year undergraduate course selection. Graduate students, with the approval of the instructor and the Graduate Program Coordinator, may take a fourth year undergraduate course in the Political Science Department. This course is taken as POLS\*6950 Specialized Topics. Course requirements are modified so that they are comparable to other courses offered at the graduate level.

### Courses at McMaster University available to students in the collaborative MA program

Descriptions of all McMaster University Graduate courses may be found at <http://academiccalendars.romcmaster.ca/index.php>

## Population Medicine

The Department of Population Medicine is an international leader in promoting the optimal health and productivity of animal populations, ensuring the safety of foods of animal origin and preventing animal-related disease in humans. MSc and PhD degrees are offered in the following fields:

- Epidemiology (MSc thesis option, MSc course-work option, PhD)
- Theriogenology (MSc thesis option)
- Health Management (MSc thesis option)
- Public Health (PhD)

Our research mission is to discover and disseminate knowledge regarding the management of health and productivity of animal populations, and the interrelationships of animals with humans and the environment. In support of this mission we rely principally on our expertise in field-based quantitative observational studies and clinical trials.

Our teaching/learning mission is to guide students as they obtain an essential knowledge base and develop the necessary communicative, quantitative and problem-solving skills to integrate and apply this knowledge; and to instill the appropriate attitudes and abilities required for life-long learning.

The department offers programs leading to MSc, Master of Public Health (MPH), PhD and DVSc degrees.

### Administrative Staff

#### Chair

Todd Duffield (2536 Stewart Bldg. , Ext. 54057)  
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#### Graduate Program Coordinator, Admissions and Administration

David L. Pearl (Clinical Research Bldg. 207B OVC, Ext. 54748)  
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#### Graduate Program Coordinator, Exams

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#### Graduate Program Assistant

Ariah Easley (102 Population Medicine, Ext. 54005)  
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### Graduate Faculty

#### Cathy Bauman

DVM, MPH, PhD Guelph - Assistant Professor

#### Olaf Berke

Dipl. Statistics, PhD Dortmund Germany - Associate Professor

#### Tracey S. Chenier

DVM, DVSc Guelph, Dip ACT - Assistant Professor

#### Jason B. Coe

DVM, PhD Guelph - Associate Professor

#### Catherine E. Dewey

DVM, MSc, PhD Guelph - Professor and Chair

#### Todd F. Duffield

DVM, DVSc Guelph - Professor

#### Robert M. Friendship

DVM, MSc Guelph, Dip ABVP - Professor

#### Cathy J. Gartley

BSc New Brunswick, DVM, DVSc Guelph, Dip ACT - Assistant Professor

#### Jessica L. Gordon

BSc, MSc Michigan State Univ., DVSc Guelph - Assistant Professor

#### Amy L. Greer

BSc, Mount Allison, MSc, Trent, PhD Arizona State - Assistant Professor

#### Michele T. Guerin

DVM, MSc, PhD Guelph - Associate Professor

#### Derek B. Haley

BHK Windsor, MSc Guelph, PhD Saskatchewan - Assistant Professor

#### Sherilee L. Harper

BSc Queen's, MSc, PhD Guelph - Assistant Professor

#### Andria Q. Jones Bitton

DVM, PhD Guelph - Associate Professor

#### David F. Kelton

DVM, MSc, PhD Guelph, Dip ABVP - Professor

#### Deep K. Khosa

BSc, DVSc, PhD Murdoch - Assistant Professor

#### Stephen J. LeBlanc

BSc McGill, DVM, DVSc Guelph - Associate Professor

#### Kerry D. Lissemore

BSc Toronto, DVM, DVSc Guelph - Associate Professor and Associate Dean, Academic

#### Scott A. McEwen

December 11, 2017

DVM, DVSc Guelph, Dip. ACVP - Professor

#### Jennifer McWhirter

BSc, PhD Waterloo - Assistant Professor

#### Paula I. Menzies

DVM Guelph, MPVM California - Professor

#### Lee E. Niel

BSc Simon Fraser, PhD UBC - Assistant Professor

#### Terri L. O'Sullivan

DVM, PhD Guelph - Assistant Professor

#### Andrew Papadopoulos

BASc Ryerson, MBA York, PhD Guelph - Associate Professor and Coordinator, Master of Public Health Program

#### David L. Pearl

BSc McGill, MSc York, DVM, PhD Guelph - Associate Professor and Graduate Program Coordinator, Admission and Administration

#### Zvonimir Poljak

DVM Croatia, MSc, PhD Guelph - Associate Professor

#### Jan M. Sargeant

DVM, MSc, PhD Guelph - Professor and Director - Centre for Public Health and Zoonoses

#### Anita Tucker

BSc, MSc, PhD Guelph - Assistant Professor

#### Jeffrey Wichtel

BVSc, PhD Massey - Professor and Dean

### Associated Graduate Faculty

#### Theresa M. Bernardo

Assoc. of Music, DVM Guelph, MSc UPEI - Contractually Limited Faculty, Population Medicine, University of Guelph

#### Shannon Majowicz

BSc, Guelph MSc Guelph, Ph.D Guelph - Assistant Professor, School of Public Health and Health Systems, University of Waterloo

#### Suzanne Millman

BSc, PhD Guelph - Associate Professor, Veterinary Diagnostic and Production Animal Medicine/Biomedical Science, Iowa State University

#### Richard Reid-Smith

BSc UWO, DVM Guelph, DVSc Guelph - Veterinary Epidemiologist, Public Health Agency of Canada

#### Jeff Wilson

DVM, DVSc, PhD Guelph - President, Novometrix Inc., Moffat

### MSc Program

The department offers a MSc by thesis in the fields of: 1) epidemiology; 2) theriogenology; and 3) health management, and a MSc by course-work in the field of: 1) epidemiology.

### Admission Requirements

When reviewing transcripts, the department focuses on the applicant's performance in undergraduate and graduate-level courses relevant to the applicant's proposed area of specialization. Students admitted must have an honours or DVM degree (or its equivalent). In addition, the department considers the applicant's special circumstances and the referees' comments. Since the core of the MSc by course work program builds on analytic skills, students entering the program should possess knowledge of basic statistical methods and their application.

All applicants should submit a one-page statement of research interests and career goals to assist in the identification of a faculty advisor who has the funding necessary to support the research. Students may be admitted into the Fall, Winter or Summer semesters.

### Degree Requirements

Students enrol in one of two study options: 1) thesis, or 2) course work and major research paper.

#### Thesis

The prescribed studies are a minimum of four courses (at least 2.0 course credits) appropriate to the discipline. Epidemiology I (POPM\*6200) is a required course for students in epidemiology; students in health management and theriogenology must take either Epidemiology I (POPM\*6200) or Applied Clinical Research (POPM\*6230). A minimum of 'B-' average is required in the prescribed studies. The department seminar course, POPM\*6100, is also required but does not count as one of the four courses. A thesis must be completed and successfully defended.

## Course Work and Major Research Paper

For the MSc by course work in the field of Epidemiology, no fewer than eight courses (at least 4.0 course credits) will be taken. These must be approved by the departmental Graduate Program Committee **and the Assistant Vice-President (Graduate Studies)**. Each student in the program will take three prescribed courses (including the Project in Epidemiology course, POPM\*6250, which is equivalent to two courses), and at least four additional courses. The department seminar course, POPM\*6100, is also required but does not count as one of the eight courses. Normally, the prescribed courses for the MSc in Epidemiology by course work will include:

### Prescribed Courses:

POPM*6210	[0.50]	Epidemiology II
POPM*6250	[1.00]	Project in Epidemiology

### Additional Courses

The four courses selected in this category will depend upon the student's background, specialty, interest and area of research.

Examples of courses suitable for inclusion in the student's program include:

PABI*6550	[0.50]	Epidemiology of Zoonoses
POPM*6230	[0.50]	Applied Clinical Research
POPM*6290	[0.50]	Epidemiology III
POPM*6350	[0.50]	Safety of Foods of Animal Origins
POPM*6950	[0.50]	Studies in Population Medicine
STAT*6920	[0.50]	Topics in Statistics
POPM*6520	[0.50]	Introduction to Epidemiological and Statistical Methods
POPM*6700	[0.50]	Swine Health Management *
POPM*6400	[0.50]	Dairy Health Management *

Additional courses other than those listed above may be deemed suitable for the student's program by the Departmental Graduate Program Coordinator after recommendations are received from the Advisory Committee.

At least three semesters of full-time study will be required for completion of the MSc program by course work and major research study option; two of these semesters must be at the University of Guelph. Normally, however, students take 4-5 semesters to complete the program.

## PhD Program

### Admission Requirements

A PhD program is offered in the fields of epidemiology and Public Health. Admission into this program is usually granted to holders of an MSc or MPH degree who have demonstrated superior performance, or to master's students who have not completed their program but wish to transfer to the PhD program and have performed exceptionally well in courses, shown exceptional aptitude and skill in research, and whose research is suitable for expansion to the doctoral level. For transfer, a thesis proposal and strongly supportive letters of reference are required. Infrequently, well qualified DVM or honours degree holders may be accepted directly into the PhD program.

All applicants should submit a one-page statement of research interests and career goals to assist in the identification of a faculty advisor who has the funding necessary to support the thesis research. Students may be admitted into the Fall, Winter or Summer semesters.

### Degree Requirements

The major emphasis in the PhD program is on the preparation of an acceptable thesis. There are no specific course requirements other than the Seminar, POPM\*6100, which must be completed twice. However, students are expected to have taken POPM\*6200 Epidemiology I (F) and POPM\*6210 Epidemiology II, or their equivalent, in their master's program. In addition, students in the Public Health field are expected to have taken POPM\*6550 Public Health Policy and Systems or its equivalent. It is usual for students, in consultation with their advisory committee, to select a suitable program of prescribed studies and additional courses. Course selection takes into account the student's background, research area, career aspirations, and need to prepare for the qualifying examination.

Courses should normally be completed before the qualifying exam is attempted. The written component of the examination is followed by an oral component (two to four hours), usually one week later. Master's holders must complete the qualifying examination by the end of the fifth semester. Students transferring from their master's program and those who enter the program directly after their honours or DVM degrees (or their equivalents) must complete the examination by the end of the seventh semester. In addition, the advisory committee is required to confirm that the student has demonstrated ability and promise in research. The PhD program is completed by the successful defence of a thesis.

## DVSc Program

The Department of Population Medicine participates in the DVSc program with recognized fields in health management and theriogenology. The normal basis for admission to DVSc studies as a regular or a provisional student is a DVM or equivalent degree that would allow the applicant to be eligible for licence to practice veterinary medicine in Ontario. The applicant must have achieved high academic standing as set out in the Admission Requirements in the DVSc program

## Health Management

Candidates must have a DVM or equivalent degree, appropriate clinical experience, cumulative average of at least a "B", and be licensed or eligible for licensing to practice veterinary medicine in Ontario. One position in ruminant health management and one position in swine health management are available during most academic years, and they normally start in May or September. It is a three-year program, which will provide training and experience in applied health management and clinical research. Approximately one-third of the time will involve clinical training, teaching final year veterinary students and service duties (including on-call), one-third course work and one-third research. Service duties in ruminant health management are with the Ruminant Field Service clinic of the Veterinary Teaching Hospital. In swine health management, clinical experience and advanced academic activities will be appropriate for a candidate preparing for board certification in Swine Health Management by the American Board of Veterinary Practitioners. The candidate will be required to complete a substantive thesis research project, related to an applied aspect of production medicine. The DVSc degree requirements include successful completion of 2.5 credits of prescribed graduate level courses, a qualifying examination in the student's discipline area, and a successful defence of a thesis. A faculty member(s) in the Department of Population Medicine will supervise each candidate for the Health Management DVSc position.

## Theriogenology

The Department of Population Medicine offers the Doctor of Veterinary Science (DVSc) degree in the field of Theriogenology. Prerequisites include a DVM or equivalent degree, one or two years of practice experience/internship, cumulative average of at least a "B", and eligibility for licensure to practice veterinary medicine in Ontario. The DVSc program provides rigorous advanced academic preparation in the discipline of Theriogenology with a view to preparation for Board Certification by the American College of Theriogenologists. The Theriogenology field at the Ontario Veterinary College is multi-species, with emphasis placed on a candidate's specific areas of interest. The DVSc differs from PhD training by emphasizing the development of both research and applied clinical skills. It is a three-year program, with approximately one-third of the time involving clinical duties within the Veterinary Teaching Hospital, including assisting in teaching of final year veterinary students. The remainder of effort is directed towards a substantive thesis research project in Theriogenology and coursework. The DVSc degree requirements include successful completion of 2.5 credits of prescribed graduate level courses, a qualifying examination and successful defense of a thesis. A faculty member(s) in the Department of Population Medicine will supervise each candidate for the Theriogenology DVSc position.

## Interdepartmental Programs

### Food Safety and Quality Assurance

The Department of Population Medicine participates in the MSc program in food safety and quality assurance. Those faculty members whose research and teaching expertise includes aspects of food safety and quality assurance may serve as advisors for MSc students. Please consult the Food Safety and Quality Assurance listing for a detailed description of the MSc program.

### Collaborative Specializations

#### International Development Studies

The Department of Population Medicine participates in the International Development Studies MSc course work/PhD collaborative specialization. Those faculty members whose research and teaching expertise includes aspects of international studies may serve as advisors for MSc course work/PhD in International Development Studies students. Please consult the International Development Studies listing for a detailed description of the collaborative specialization.

#### Neuroscience

The Department of Population Medicine participates in the Neuroscience MSc/PhD collaborative specialization. Those faculty members whose research and teaching expertise includes aspects of neuroscience may serve as advisors for MSc/PhD in Neuroscience students. Please consult the Neuroscience listing for a detailed description of the collaborative specialization.

### Courses

\*Given in alternate years.

## Epidemiology

POPM*6200 Epidemiology I F [0.50]
This course covers concepts, principles and methods of basic and applied epidemiology, including the following topics: sampling, measuring disease frequency, clinical epidemiology, descriptive epidemiology, causal reasoning and design, interpretation and critical appraisal of surveys, observational studies, field trials and critical appraisal.
<i>Restriction(s):</i> MPH and Population medicine students. Instructor consent required.
<i>Department(s):</i> Department of Population Medicine

**POPM\*6210 Epidemiology II W [0.50]**

Advanced study design and analytic methods for the analysis of data from observational studies and surveys.

*Department(s):* Department of Population Medicine

**POPM\*6220 Analytical Epidemiology S [0.50]**

This course focuses on the advanced analysis of epidemiologic studies. Case control, cohort and survival studies are analysed within the generalized linear-model framework. Links between study objectives, study design and data analysis will be emphasized throughout. Special problems, such as the analysis of correlated data arising from cluster sampling of individuals, are discussed.

*Prerequisite(s):* POPM\*6210 and POPM\*6290

*Department(s):* Department of Population Medicine

**POPM\*6230 Applied Clinical Research F [0.50]**

This course is designed to help clinical researchers design, fund, and analyze their clinical research. Emphasis is placed upon planning a well-designed clinical trial and writing a well-organized grant proposal.

*Department(s):* Department of Population Medicine

**POPM\*6250 Project in Epidemiology S [1.00]**

Collection and analysis of field data and the preparation of a written report suitable for publication, and oral presentation of the findings to the graduate faculty. This course is part of the MSc program by course work in epidemiology.

*Department(s):* Department of Population Medicine

**POPM\*6290 Epidemiology III F [0.50]**

This course gives an overview of advanced methods for the analysis of data of clustered/correlated data as opposed to independent data. Special emphasis is on spatial, longitudinal, survival data and time series data.

*Prerequisite(s):* POPM\*6210 (or equivalent graduate course from another university)

*Department(s):* Department of Population Medicine

**POPM\*6520 Introduction to Epidemiological and Statistical Methods F [0.50]**

This is a 0.5 credit introductory graduate course for MPH students and students interested in epidemiology. The course will provide an introduction to research design, grant proposal writing, and critical appraisal, as well as survey (questionnaire) design and basic statistical methods for epidemiological studies.

*Co-requisite(s):* POPM\*6200

*Department(s):* Department of Population Medicine

**Health Management****POPM\*6400 Dairy Health Management \* S [0.50]**

This course stresses a population-based, herd-level approach to dairy herd health management, in which optimizing the efficiency of the dairy enterprise is the overall goal. The biological and economic impacts of disease and management deficiencies on herd performance will be discussed as they relate to design and implementation of herd health programs. The course will emphasize the critical role of record keeping, data analysis and monitoring on program success.

*Department(s):* Department of Population Medicine

**POPM\*6700 Swine Health Management \* U [0.50]**

Diseases of swine are studied with particular emphasis on preventive medicine and herd-health management.

*Department(s):* Department of Population Medicine

**Therigenology****POPM\*6610 Therigenology of Cattle \* U [0.50]**

A lecture/seminar course emphasizing the relationship of nutritional, genetic, endocrine, anatomic, and environmental factors with the reproductive health of cattle. Application of reproductive technologies will also be covered.

*Department(s):* Department of Population Medicine

**POPM\*6630 Therigenology of Horses \* U [0.50]**

A lecture/seminar course covering the genetic, endocrine, anatomic and environmental factors that affect reproductive performance and health of horses. Breeding management, including recent technologies, and management of the infertile animal will be included.

*Department(s):* Department of Population Medicine

**POPM\*6650 Therigenology of Dogs and Cats \* U [0.50]**

A seminar/lecture series that includes the theory and management of clinical reproduction for the dog and cat, including use of developing technologies.

*Department(s):* Department of Population Medicine

**POPM\*6670 Therigenology of Small Ruminants \* U [0.50]**

A seminar/laboratory course emphasizing advanced reproductive management of sheep, goats and farmed deer/elk, with the emphasis on a sheep production model. New reproductive technologies will be included.

*Department(s):* Department of Population Medicine

**Other****POPM\*6100 Seminar F [0.00]**

A practical course that utilizes tutorials, workshops, self and peer reviewed assessment to help participants develop skills in public speaking and presentation of scientific data. Each student presents at least one seminar on an approved subject during the departmental seminar series.

*Department(s):* Department of Population Medicine

**POPM\*6950 Studies in Population Medicine U [0.50]**

Assigned reading and/or special projects selected to provide in-depth study of topics appropriate to the specialized interests of individual students. Courses offered under this title have included Special Topics in Public Health; Ecology and Health; Systems Approaches; and Animal Welfare. Different offerings are assigned different section numbers.

*Department(s):* Department of Population Medicine

**Public Health****POPM\*6350 Safety of Foods of Animal Origins F [0.50]**

The detection, epidemiology, human health risk, and control of hazards in food of animal origin.

*Offering(s):* Offered through Distance Education format only.

*Department(s):* Department of Population Medicine

**POPM\*6510 Community Health Promotion F [0.50]**

The objective of this course is to provide students with an understanding of public health, population health and health promotion. Topics will include perspectives on health and illness, injury prevention, determinants of health, population diversity and the role of evidence in public health decision-making.

*Department(s):* Department of Population Medicine

**POPM\*6530 Health Communication W [0.50]**

This course introduces communication theory, best practices, and skills related to public health. Students will learn about the written, oral, and visual communication of health information for professional, peer, and lay audiences. Students will apply their knowledge by creating a portfolio of health communication materials.

*Restriction(s):* MPH students. Instructor consent required.

*Department(s):* Department of Population Medicine

**POPM\*6540 Concepts in Environmental Public Health W [0.50]**

This course covers the main concepts of environmental public health including basic elements of environmental toxicology, risk analysis, air and water quality, food safety, waste, occupational health and eco health.

*Department(s):* Department of Population Medicine

**POPM\*6550 Public Health Policy and Systems W [0.50]**

This course covers concepts and principles of public health policy and systems including: public health systems, their structure, funding and governance and their integration into the healthcare system; evolution of public health policy; models of policy development and analysis; stakeholder analysis; and, public health ethics.

*Department(s):* Department of Population Medicine

**POPM\*6560 Public Health Practicum U [1.00]**

In this 1.0 credit course, students will synthesize theoretical concepts, learned via prior coursework, with public health practice. Students will work in a host public health agency for a 12-to 16-week period, focusing on a major project of significance to the host organization.

*Prerequisite(s):* POPM\*6200, POPM\*6510, POPM\*6520, POPM\*6530, POPM\*6540, and POPM\*6550

*Restriction(s):* MPH students only. Instructor consent required.

*Department(s):* Department of Population Medicine

**POPM\*6570 Public Health Capstone F [0.00]**

This course serves as a capstone for students in the Master of Public Health program to reflect on, interpret, and present their practicum work in a variety of formats, including public presentation, to enhance their communication skills and abilities.

*Prerequisite(s):* POPM\*6560 or instructor's signature required

*Department(s):* Department of Population Medicine

**POPM\*6580 Public Health Administration F [0.50]**

This course will teach students to develop, implement and improve public health programs. Understanding an organization's mission and priorities, and developing business plans is critical for an effective administrator. Furthermore, it introduces theories and effective components of leadership and describes the practical role of the leader.

*Department(s):* Department of Population Medicine

**POPM\*6590 Public Health Practicum II W [1.00]**

This course allows students in the Master of Public Health program to undertake an optional second practicum experience. They will work in a host public health organization or agency for a 12- to 16-week period, focusing on a major project of significance to the host organization.

*Prerequisite(s):* POPM\*6560

*Restriction(s):* Public Health program. Instructor consent required.

*Department(s):* Department of Population Medicine

## Psychology

The Department of Psychology offers programs in four fields of psychology: 1) applied social psychology, 2) clinical psychology: applied developmental emphasis and 3) industrial/organizational psychology, 4) neuroscience and applied cognitive science.

### • Applied Social Psychology (MA, PhD)

Applied Social Psychology is based on the investigation of social processes and problems of significance to the general community and to specific groups. Areas of investigation may include, but are not limited to, aging, ethics, health, policy, equity, community services, the environment, ethnicity, and gender. Diverse research strategies, including qualitative and quantitative methods, are used to answer questions related to social issues. Graduate study in Applied Social Psychology is designed to prepare students for academic and applied research careers in a wide range of settings. The graduate program has two emphases: (1) the pursuit of advanced research, and (2) the design and evaluation of programs that aim to reduce social problems and promote human welfare.

### • Clinical Psychology: Applied Developmental Emphasis (MA, PhD)

The area of Clinical Psychology: Applied Developmental Emphasis concentrates on understanding the development and treatment of psychological disorders experienced by children, youth and families. This includes a focus on the social, emotional, cognitive, and neurobiological features of normal and atypical development; risk and protective factors that influence the nature and progression of atypical development and response to treatment; and approaches to assessment, psychodiagnosis, and intervention. Also considered is the developmental impact of stressful life events such as divorce, illness, poverty, adoption, and death. Training in this field follows an integrated series of courses and practica which contributes to and mutually supports the students' acquisition of competence as both practitioners and researchers. Students participate in our on-campus clinic, the Centre for Psychological Services, and complete off campus practica in hospitals, schools and mental health settings under the supervision of registered psychologists. This training allows students to enter careers involving clinical and/or research positions in mental health centres, hospitals, schools, and the private sector, as well as careers involving teaching and research in university settings. It also prepares students for registration as psychologists with provincial licensing boards.

### • Industrial/Organizational Psychology (MA, PhD)

The objective of study in the area of Industrial/Organizational Psychology is to train future professionals in the area of Industrial/Organizational Psychology following the guidelines established by the Canadian Society for Industrial/Organizational Psychology. Graduate students are expected to obtain a high level of proficiency in both research skills and practice in the core areas of Industrial/Organizational Psychology including personnel selection, organizational behaviour, work attitudes, performance appraisal, and measurement of individual differences. Graduates from this field of study will be in a position to enter careers in a wide range of private and public sector organizations, including universities, consulting firms, industries, and government agencies.

### • Neuroscience and Applied Cognitive Science (MSc, PhD)

This program encompasses: basic cognitive processes, behavioural neuroscience, cognitive ergonomics, cognitive neuroscience, developmental and life-span cognition, and foundations of cognitive science. Students in these disciplines have the opportunity to learn about the interdisciplinary work of other students, faculty and outside researchers in the weekly research seminar in Neuroscience and Applied Cognitive Science. Additionally, students take courses specific to their research. A unique feature of this area of study is the practicum that provides students with additional specific training in a research laboratory, hospital, government agency, or non-government agency.

Note that the Masters programs are an integral part of the doctoral studies and students are admitted with the expectation of completing the doctoral degree. These areas of study, which are described below, provide training in both research and professional skills, as well as a firm grounding in theory and research in relevant content areas. See the department website at <http://www.psychology.uoguelph.ca> for additional information.

Faculty in Psychology also participate in the interdepartmental programs in Neuroscience and Toxicology

## Administrative Staff

### Chair

Francesco Leri (4013 MacKinnon, Ext. 58264)  
fleri@uoguelph.ca

### Graduate Program Coordinator

Peter Hausdorf (3013 MacKinnon Ext, Ext. 53976)  
phausdor@uoguelph.ca

### Graduate Program Assistant

Robin Sorbara (4014 MacKinnon, Ext. 53508)  
robinfra@uoguelph.ca

## Graduate Faculty

### Naseem Al-Aidroos

December 11, 2017

BSc Waterloo, MA, PhD Toronto - Assistant Professor

### Heidi N. Bailey

BA British Columbia, PhD Western - Associate Professor

### Paula Barata

BA British Columbia, MA, PhD Windsor - Associate Professor

### Patrick Barclay

BSc Guelph, PhD McMaster - Associate Professor

### Elena Choleris

BSc, PhD Parma (Italy) - Professor

### Donald Dedrick

BA, MA Carleton, PhD Toronto - Associate Professor, (cross-appointed with Department of Philosophy)

### Serge Desmarais

BA, MA, PhD Waterloo - Professor, Interim Provost and Vice-President (Academic)

### Mark J. Fenske

BSc Lethbridge, MA, PhD Waterloo - Associate Professor and Graduate Program Coordinator

### Christopher Fiacconi

BSc Western, PhD McMaster - Assistant Professor

### Benjamin Giguère

BA McGill, MA, PhD York - Assistant Professor

### Harjinder Gill

BA Waterloo, MA, PhD Western Ontario - Associate Professor

### Gloria Gonzalez-Morales

BA La Laguna, DIPL, PhD Valencia - Associate Professor

### Peter A. Hausdorf

BSc McMaster, MA Guelph, PhD McMaster - Associate Professor

### Karl H. Hennig

BEd, MA, PhD British Columbia - Assistant Professor

### Francesco Leri

BA, MA, PhD McGill - Professor and Chair

### Stephen Lewis

BSc, PhD Dalhousie - Associate Professor

### Margaret N. Lumley

BA Waterloo, MA, PhD Queen's - Associate Professor

### Harvey H.C. Marmurek

BA Toronto, MA, PhD Ohio State - Professor

### C. Meghan McMurty

BA Laurier, PhD Dalhousie - Assistant Professor

### Daniel V. Meegan

BA SUNY at Albany, PhD McMaster - Associate Professor

### Barbara A. Morrongiello

BA Douglass College (Rutgers), MS, PhD Massachusetts - Professor, Canada Research Chair

### Ian R. Newby-Clark

BSc Toronto, PhD Waterloo - Associate Professor

### Kieran O'Doherty

BSc Witwatersrand, BHSc, PhD Adelaide - Associate Professor

### Linda A. Parker

BA, MA California State, Long Beach PhD Memorial - Professor, Canada Research Chair

### Deborah Powell

BA Queen's, MA, PhD Western - Associate Professor

### Saba F. Safdar

BA McMaster, MA, PhD York - Associate Professor

### Leanne S.M. Son Hing

BA Queen's, MA, PhD Waterloo - Associate Professor and Associate Chair

### Jeffrey Spence

BA Laurier, MA, PhD Waterloo - Associate Professor

### David Stanley

BA Waterloo, MA, PhD Western Ontario - Associate Professor

### Lana M. Trick

BSc Calgary, MA, PhD Western Ontario - Professor

### Franco Vaccarino

BSc Toronto, MA, PhD McGill - Professor, President, and Vice-Chancellor

### Boyer D. Winters

BA Dalhousie, PhD Cambridge - Associate Professor and Director of Collaborative Neuroscience

### Jeffery Yen

BSc MA Rhodes, PhD Toronto - Assistant Professor

### Arlene Young

BA Guelph, MSASc, PhD Waterloo - Associate Professor and Director of Clinical Training

## MA Program

The MA program is offered in: 1) Applied Social Psychology; 2) Clinical Psychology: Applied Developmental Emphasis; and 3) Industrial/Organizational Psychology.

### Admission Requirements

Consideration for admission to the MA program in the areas of Applied Social Psychology, Clinical Psychology: Applied Developmental Emphasis, or Industrial/Organizational Psychology will be given to students with an Honours BA or BSc (or its equivalent) in Psychology and a minimum of a 'B+' standing. Students are normally expected to have taken courses across the breadth of psychology with some courses in the area to which they are applying. A strong background in methodology and statistics is expected. As well, applicants must have undertaken an Honours thesis research project or senior research project equivalent. Students are admitted to the MA program with the understanding that they intend to proceed to the PhD program. To apply for admission, applicants must view "How to Apply" in the section Prospective Students... Graduate, in the Psychology Department website <http://www.psychology.uoguelph.ca> This is a self administered application.

### Degree Requirements

#### Applied Social Psychology

PSYC\*6060 [0.50] Research Design and Statistics  
OR  
PSYC\*6940 [0.50] Discrete-variable Statistics  
(upon consultation with Advisor as to which is most appropriate)

PSYC\*6471 [0.50] Practicum I  
PSYC\*6880 [0.25] Ethical Issues in Psychology

At least 2 of the following 3 core AS courses:

PSYC\*6910 [0.50] Critical Approaches to Applied Social Psychology  
PSYC\*6920 [0.50] Applied Social Psychology and intervention  
PSYC\*6930 [0.50] Community, Culture & Global Citizenship

At least 1 elective from the following list:

PSYC\*6380 [0.50] Psychological Applications of Multivariate Analysis  
PSYC\*6521 [0.25] Research Seminar I  
PSYC\*6670 [0.50] Research Methods  
PSYC\*6840 [0.50] Program Evaluation  
PSYC\*6950 [0.50] Qualitative Methods in Psychology  
PSYC\*7070 [0.50] Psychological Measurement

And MA Thesis.

#### Clinical Psychology: Applied Developmental Emphasis

PSYC\*6000 [0.50] Developmental Psychopathology: Etiology and Assessment  
PSYC\*6010 [0.50] Learning Disorders: Research and Clinical Practice  
PSYC\*6020 [0.50] Clinical and Diagnostic Interviewing Skills  
PSYC\*6060 [0.50] Research Design and Statistics  
OR

PSYC\*6940 [0.50] Discrete-variable Statistics  
(upon consultation with Advisor as to which is most appropriate)

PSYC\*6630 [0.50] Developmental Psychology  
PSYC\*6690 [0.50] Cognitive Assessment of Children and Adolescents  
PSYC\*6700 [0.50] Personality and Social Assessment of Children and Adolescents

PSYC\*6880 [0.25] Ethical Issues in Psychology  
PSYC\*7991 [0.25] CP:ADE Clinical Practicum I  
PSYC\*7992 [0.50] CP:ADE Clinical Practicum II

And MA Thesis.

#### Industrial/Organizational Psychology

PSYC\*6060 [0.50] Research Design and Statistics  
PSYC\*6380 [0.50] Psychological Applications of Multivariate Analysis  
PSYC\*6670 [0.50] Research Methods  
PSYC\*7080 [0.00] Consulting in Industrial/Organizational Psychology  
PSYC\*7130 [0.50] Introduction to Industrial/Organizational Psychology

At least 2 of the following set of 3 electives:

PSYC\*7010 [0.50] Recruitment and Selection: Methods and Outcomes  
PSYC\*7020 [0.50] Employee Performance  
PSYC\*7160 [0.50] Employee Development: Methods and Outcomes

At least 2 of the following set of 3 electives:

PSYC\*7030 [0.50] Work Attitudes and Behaviour  
PSYC\*7040 [0.50] Social Processes in the Workplace  
PSYC\*7190 [0.50] Work Motivation and Leadership

And MA Thesis

### MSc Program

The MSc program is offered in the field of: 1) Neuroscience and Applied Cognitive Science.

### Admission Requirements

Consideration for admission to the MSc program will be given to students with an honours BA or BSc (or its equivalent) in Psychology or a related field of study (e.g. neuroscience) and a minimum of a 'B+' standing. Students are normally expected to have taken courses across the breadth of psychology with some courses in the area to which they are applying. A strong background in methodology and statistics is expected. As well, applicants must have undertaken an Honours thesis research project or senior research project equivalent. Students are admitted to the MSc program with the understanding that they intend to proceed to the PhD program.

### Degree Requirements

The program involves three components:

1. Preparatory Course Work Students will acquire knowledge and skills necessary to carry out Neuroscience and Cognitive Science research in academic and/or applied settings. This will involve a course in Research Design and Statistics, a course in Research Ethics (Animal research ethics or Human research ethics), at least one elective in their specific field of research and the Research Seminar in Neuroscience and Applied Cognitive Science.
2. Practicum One of the unique features of University of Guelph's Neuroscience and Applied Cognitive Science masters program is the practicum. Students will complete a practicum in a variety of research settings, including government agencies, hospitals, businesses, and other research laboratories. The practicum may involve learning a new technique in a laboratory other than that of the advisor. Practicum experiences will be tailored to the student's interests, and will enable student to acquire and refine skills and develop professional contacts. The research practicum is a required course for Masters students.
3. Thesis research Students will carry out an independent research project under the supervision of a faculty supervisor. This will involve a thesis for the Masters program.

PSYC\*6060 [0.50] Research Design and Statistics

OR

PSYC\*6940 [0.50] Discrete-variable Statistics

(upon consultation with Advisor as to which is most appropriate)

PSYC\*6471 [0.50] Practicum I

PSYC\*6472 [1.00] Practicum II

PSYC\*6473 [0.25] Practicum III

(upon consultation with Advisor/Practicum Coordinator as to which is most appropriate)

PSYC\*6740 [0.50] Research Seminar in Neuroscience and Applied Cognitive Science A

PSYC\*6880 [0.25] Ethical Issues in Psychology

OR

UNIV\*6600 [0.00] Animal Care Short Course

Students must also take at least 1 of the following electives:

PSYC\*6750 [0.50] Applications of Cognitive Science

PSYC\*6780 [0.50] Foundations of Cognitive Science

PSYC\*6790 [0.50] Memory and Cognition

PSYC\*6800 [0.50] Neurobiology of Learning

PSYC\*6810 [0.50] Neuropsychology

NEUR\*6000 [0.50] Principles of Neuroscience

Students are also given the option of choosing a graduate elective from outside this list with the permission of their advisor.

If students take more than one year to complete their Masters degree, then for each Fall and Winter semester until they graduate, they must register in PSYC\*6760 [0.0] Research Seminar in Neuroscience and Applied Cognitive Science B.

All students must also complete a MSc thesis.

### PhD Program

The PhD program is offered in the fields: 1) applied social psychology; 2) clinical psychology: applied developmental emphasis; 3) industrial/organizational psychology; and 4) neuroscience and applied cognitive science.

### Admission Requirements

Students must have completed Masters requirements in the appropriate field of study (Neuroscience and Applied Cognitive Science; Applied Social Psychology; Clinical Psychology: Applied Developmental Emphasis; Industrial/Organizational Psychology) with a minimum 'A-' standing to be eligible for admission to the PhD program. These Masters requirements are normally met within the department in a two-year course of studies comprising specified course work and a thesis. Students admitted to the PhD program who have completed MA or MSc degrees in other fields of study and/or from other universities may be required to take Masters level courses to ensure adequate background preparation for PhD work.

### Degree Requirements

#### Applied Social Psychology

PSYC\*6900 [0.50] Philosophy and History of Psychology as a Science

One of the following:

PSYC\*6380 [0.50] Psychological Applications of Multivariate Analysis

PSYC\*6950 [0.50] Qualitative Methods in Psychology

One of the following 3 core AS courses:

PSYC\*6910 [0.50] Critical Approaches to Applied Social Psychology

PSYC\*6920 [0.50] Applied Social Psychology and intervention

PSYC\*6930 [0.50] Community, Culture & Global Citizenship

One elective course to be determined in consultation with the student's PhD Advisory Committee and approved by the Graduate Area Representative.

One of the following two experiential courses:

PSYC\*6471 [0.50] Practicum I

OR

PSYC\*6472 [1.00] Practicum II

PSYC\*6522 [0.50] Research Seminar II

Qualifying Exam;

And PhD Thesis.

### Clinical Psychology: Applied Developmental Emphasis

PSYC\*6580 [0.50] Models of Child and Adolescent Psychotherapy

PSYC\*6610 [0.50] Advanced Child and Adolescent Psychotherapy

PSYC\*6840 [0.50] Program Evaluation

PSYC\*6890 [0.25] Legislation and Professional Practice

PSYC\*6900 [0.50] Philosophy and History of Psychology as a Science

PSYC\*7070 [0.50] Psychological Measurement

PSYC\*7993 [1.00] CP:ADE Clinical Practicum III

If a student has not completed 2 senior undergraduate half courses in the biological bases of behaviour, the following course is required:

PSYC\*6810 [0.50] Neuropsychology

If a student has not completed 2 senior undergraduate half courses in social bases of behavior, the following course is required:

PSYC\*6920 [0.50] Applied Social Psychology and intervention

OR

PSYC\*6930 [0.50] Community, Culture & Global Citizenship

If a student has not completed 2 senior undergraduate half courses in the cognitive-affective bases of behaviour, the following course is required:

PSYC\*6790 [0.50] Memory and Cognition

The following course is required if a student has not taken a one half undergraduate course of this nature:

PSYC\*6900 [0.50] Philosophy and History of Psychology as a Science

Qualifying Exam;

PSYC\*8000 [0.00] Clinical Internship

And PhD Thesis.

### Industrial/Organizational Psychology

PSYC\*6900 [0.50] Philosophy and History of Psychology as a Science

PSYC\*7070 [0.50] Psychological Measurement

PSYC\*7080 [0.00] Consulting in Industrial/Organizational Psychology

And if not already taken during Master's Degree:

PSYC\*7130 [0.50] Introduction to Industrial/Organizational Psychology

At least 1 of the following set of 3 courses:

PSYC\*7010 [0.50] Recruitment and Selection: Methods and Outcomes

PSYC\*7020 [0.50] Employee Performance

PSYC\*7160 [0.50] Employee Development: Methods and Outcomes

At least 1 of the following set of 3 courses:

PSYC\*7030 [0.50] Work Attitudes and Behaviour

PSYC\*7040 [0.50] Social Processes in the Workplace

PSYC\*7190 [0.50] Work Motivation and Leadership

One elective from:

PSYC\*6840 [0.50] Program Evaluation

PSYC\*7140 [0.50] Industrial/Organizational Psychology Special Topic  
Doctoral Research Seminar

PSYC\*7170 [0.50] Industrial/Organizational Psychology Doctoral Research  
Internship I

PSYC\*7180 [0.50] Industrial/Organizational Psychology Doctoral Research  
Internship II

Qualifying Exam;

And PhD Thesis.

### Neuroscience and Applied Cognitive Science

PSYC\*6760 [0.00] Research Seminar in Neuroscience and Applied Cognitive  
Science B

(must be taken each year of the program)

For students coming from other Master's programs:

PSYC\*6880 [0.25] Ethical Issues in Psychology

OR

UNIV\*6600 [0.00] Animal Care Short Course

Three elective courses from the list below, with the option of PSYC\*6472 which is credited as 2 electives.

PSYC\*6472 [1.00] Practicum II

PSYC\*6473 [0.25] Practicum III

PSYC\*6750 [0.50] Applications of Cognitive Science

PSYC\*6780 [0.50] Foundations of Cognitive Science

PSYC\*6790 [0.50] Memory and Cognition

PSYC\*6800 [0.50] Neurobiology of Learning

PSYC\*6810 [0.50] Neuropsychology

PSYC\*6900 [0.50] Philosophy and History of Psychology as a Science

NEUR\*6000 [0.50] Principles of Neuroscience

Students are also given the option of choosing a graduate elective from outside this list with the permission of their advisor.

Qualifying Exam;

And PhD Thesis

### Collaborative Specializations

Faculty in Psychology also participate in the collaborative specializations in Neuroscience and Toxicology

### Courses

**Restriction:** All courses are restricted to Psychology graduate students; all others are by permission only. Students from all areas of Psychology may choose from the Department Core courses. For convenience, the other graduate courses are categorized by area, but students from any area may take courses from outside their specific area with the permission of their thesis advisor and with instructor consent. In fact, in some cases, students are encouraged to take courses out of area as these courses are specified in their list of electives or required courses.

### Departmental Core Courses

#### PSYC\*6060 Research Design and Statistics U [0.50]

This course covers non-parametric and parametric hypothesis testing and estimation, analysis of variance and covariance, and multiple correlation and multiple regression. Current controversial issues are presented.

*Department(s):* Department of Psychology

#### PSYC\*6190 Research Project U [1.00]

This course is an option for students in the applied streams of MA studies who do not plan on proceeding to a PhD program. Under the supervision of a faculty member, students will design and conduct an empirical investigation in their area of emphasis.

*Department(s):* Department of Psychology

#### PSYC\*6380 Psychological Applications of Multivariate Analysis U [0.50]

This course emphasizes the use of multivariate techniques in psychological research. Both predictive (e.g., regression, canonical correlation, discriminant analysis, MANOVA) and reduction (e.g., factor analysis, multidimensional scaling, cluster analysis) techniques are considered in addition to the use of both observed and latent variable structural models.

*Department(s):* Department of Psychology

#### PSYC\*6401 Reading Course I U [0.25]

An independent in-depth study of current theoretical and empirical issues in the student's area of specialization.

*Department(s):* Department of Psychology

#### PSYC\*6402 Reading Course II U [0.50]

An independent in-depth study of current theoretical and empirical issues in the student's area of specialization.

*Department(s):* Department of Psychology

#### PSYC\*6411 Special Problems in Psychology I U [0.25]

A critical examination of current problems relating to conceptual and methodological developments in an area of psychology.

*Department(s):* Department of Psychology

#### PSYC\*6412 Special Problems in Psychology II U [0.50]

A critical examination of current problems relating to conceptual and methodological developments in an area of psychology.

*Department(s):* Department of Psychology

#### PSYC\*6471 Practicum I U [0.50]

Students will gain 2-3 days per week of supervised experience in a setting related to their field of specialization.

*Department(s):* Department of Psychology

#### PSYC\*6472 Practicum II U [1.00]

See PSYC\*6471 . Students work four to five days a week in the selected setting.

*Department(s):* Department of Psychology

**PSYC\*6473 Practicum III U [0.25]**

See PSYC\*6471. This course is intended for students who wish to gain additional practicum experience after completing the requirements for PSYC\*6471/PSYC\*6472. Students work one day a week in the selected setting.

*Department(s):* Department of Psychology

**PSYC\*6521 Research Seminar I U [0.25]**

An in-depth review of current theoretical and empirical developments in topic areas related to the student's area of specialization.

*Department(s):* Department of Psychology

**PSYC\*6522 Research Seminar II U [0.50]**

An in-depth review of current theoretical and empirical developments in topic areas related to the student's area of specialization. The course requirements may include the completion of an empirical research project.

*Department(s):* Department of Psychology

**PSYC\*6670 Research Methods U [0.50]**

This course emphasizes those techniques most frequently used in applied and field settings. These include: quasi-experimental designs, survey research, interviewing, questionnaire design, observational techniques, and other more qualitative methods.

*Department(s):* Department of Psychology

**PSYC\*6880 Ethical Issues in Psychology U [0.25]**

Relevant issues in the application of professional ethical standards to the practice of psychology, including consultation, field research, intervention, and decision-making models are discussed in this half course. Depending on the particular faculty and students involved, discussion emphasizes specific applications to either I/O or applied developmental/social psychology.

*Department(s):* Department of Psychology

**PSYC\*6890 Legislation and Professional Practice U [0.25]**

This companion course to PSYC\*6880, Ethics in Psychology, provides an introduction to the Provincial and Federal legislation governing the practice of psychology. Students will become familiar with legislation relevant to professional practice with children and adults in hospital, educational, community, and other settings.

*Co-requisite(s):* PSYC\*6880

*Department(s):* Department of Psychology

**PSYC\*6900 Philosophy and History of Psychology as a Science U [0.50]**

This doctoral course examines the philosophical and metatheoretical issues involved in the scientific analysis of human experience. Both the historical context of these issues and the status of current metatheoretical debates are covered.

*Department(s):* Department of Psychology

**PSYC\*6940 Discrete-variable Statistics U [0.50]**

This course is an in-depth examination of statistical approaches used in psychology, with an emphasis on experimental research designs with discrete independent variables (e.g., t-test, ANOVA, general linear model), and how these approaches address ongoing statistical challenges faced by psychological researchers, such as replication and generalizability.

*Department(s):* Department of Psychology

**PSYC\*6950 Qualitative Methods in Psychology U [0.50]**

The purpose of this course is to provide students with foundational knowledge and skills to conduct qualitative research in psychology. Approaches that will be covered may include discursive psychology, critical discourse analysis, grounded theory, thematic analysis, ethnography, and interpretive phenomenological analysis.

*Department(s):* Department of Psychology

**PSYC\*7070 Psychological Measurement U [0.50]**

Concepts and applications of classical measurement theory, especially reliability and validity of tests and measurements used in applied psychology. Principles of test construction, standardization, norming, administration, and interpretation are discussed, as well as integration of test information and its use in decision making.

*Restriction(s):* Instructor consent required.

*Department(s):* Department of Psychology

**Neuroscience and Applied Cognitive Science****PSYC\*6740 Research Seminar in Neuroscience and Applied Cognitive Science A U [0.50]**

This course will expose graduate students to some of the major theories, issues and methodologies driving research in the broad field of Neuroscience and Applied Cognitive Science. Students will learn to critically evaluate presentations by researchers as well as to communicate the results of their own research, in both a written and oral format. All first year master's students in NACS are required to enroll in this course in both the fall and winter semesters.

*Department(s):* Department of Psychology

**PSYC\*6750 Applications of Cognitive Science U [0.50]**

This course surveys applications of cognitive science to the problem of optimizing human performance. Topics of discussion will include human-system interactions (including Human-Computer and Human-Vehicle), education, and cognitive rehabilitation.

*Department(s):* Department of Psychology

**PSYC\*6760 Research Seminar in Neuroscience and Applied Cognitive Science B U [0.00]**

This course will expose graduate students to some of the major theories, issues and methodologies driving the research broad field of Neuroscience and Applied Cognitive Science. Students will learn to critically evaluate presentations by researchers in this field as well as to communicate the results of their own research, in both a written and oral format. All second year master's and doctoral students in NACS are required to enroll in this course each fall and winter semester of their graduate program until they graduate.

*Department(s):* Department of Psychology

**PSYC\*6780 Foundations of Cognitive Science U [0.50]**

Cognitive Science is an inter-disciplinary field that encompasses cognitive psychology, neuroscience, philosophy, and computer science. The foundational issues and basic methodologies that define cognitive science will be discussed, with specific examples from perception, learning, memory, language, decision-making, and problem solving.

*Restriction(s):* Restricted to Psychology graduate students; all others by permission only

*Department(s):* Department of Psychology

**PSYC\*6790 Memory and Cognition U [0.50]**

This course reviews the major theories, issues and methodologies guiding contemporary research in human memory and related aspects of human cognition. Topics include the encoding and retrieval of information, the nature of representations in memory, classifications of memory, and applications to reading and eyewitness testimony.

*Department(s):* Department of Psychology

**PSYC\*6800 Neurobiology of Learning U [0.50]**

This course reviews the major theories, issues, and methodologies guiding contemporary research in the neurobiology of learning.

*Department(s):* Department of Psychology

**PSYC\*6810 Neuropsychology U [0.50]**

This course focuses on current developments in neuropsychology. Particular emphasis is placed on the aphasias, apraxias, memory disorders, and disorders of movement.

*Department(s):* Department of Psychology

**Applied Social Psychology****PSYC\*6270 Issues in Social Policy U [0.50]**

This doctoral course examines historical developments and selected contemporary policy domains in Canada. Topics may include policies affecting children, families, the elderly, First Nations people, the mentally and physically disabled, and one parent families. The course also addresses the interplay between social and psychological research and policy formation, as well as the use of social policy as an instrument of social change.

*Department(s):* Department of Psychology

**PSYC\*6840 Program Evaluation U [0.50]**

This course provides an introduction to a variety of methods of social program evaluation and to the process of consultation with program staff.

*Department(s):* Department of Psychology

**PSYC\*6910 Critical Approaches to Applied Social Psychology U [0.50]**

The purpose of this course is to introduce students to critical approaches to applied social psychology. The course will address theoretical traditions and methodologies that take as their starting point a reflexive critique and evaluation of culture, society, and its institutions.

*Department(s):* Department of Psychology

**PSYC\*6920 Applied Social Psychology and intervention U [0.50]**

This course will critically examine theoretical approaches and research in the field of applied social psychology with a particular focus on work aimed at generating intervention strategies intended to ameliorate social and practical problems. The course will also consider implications for social policy.

*Department(s):* Department of Psychology

**PSYC\*6930 Community, Culture & Global Citizenship U [0.50]**

The purpose of this course is to conceptualize community and cultural psychological work in the context of global citizenship. The course will cover theory and methods for addressing such issues as community health, poverty, violence, immigration, diversity and acculturation, in an interconnected, interdependent and globalized world.

*Department(s):* Department of Psychology

## Clinical Psychology: Applied Developmental Emphasis

### PSYC\*6000 Developmental Psychopathology: Etiology and Assessment U [0.50]

The interaction of neurobiological, physiological, familial and social factors to an understanding of developmental psychopathology is the focus of this course. Emphasis is given to etiology and clinical assessment issues.

*Department(s):* Department of Psychology

### PSYC\*6010 Learning Disorders: Research and Clinical Practice U [0.50]

This course examines various cognitive, social, and educational components of learning and language disorders and accompanying clinical methods of diagnosis and remediation.

*Department(s):* Department of Psychology

### PSYC\*6020 Clinical and Diagnostic Interviewing Skills S [0.50]

This course provides practical training in clinical and diagnostic interviewing. Through role-play, direct observation, and in-vivo practice, students will learn how to conduct assessment and diagnostic interviews, and clinical dialogues with children and adults. This course is open only to graduate students in the CP:ADE field.

*Prerequisite(s):* Completion of all MA level course work except for the thesis

*Restriction(s):* Open only to graduate students in the Clinical Psychology: Applied Developmental Emphasis (CP:ADE) field

*Department(s):* Department of Psychology

### PSYC\*6270 Issues in Social Policy U [0.50]

This doctoral course examines historical developments and selected contemporary policy domains in Canada. Topics may include policies affecting children, families, the elderly, First Nations people, the mentally and physically disabled, and one parent families. The course also addresses the interplay between social and psychological research and policy formation, as well as the use of social policy as an instrument of social change.

*Department(s):* Department of Psychology

### PSYC\*6580 Models of Child and Adolescent Psychotherapy U [0.50]

This course introduces a variety of therapeutic models for addressing problems of atypical development.

*Department(s):* Department of Psychology

### PSYC\*6610 Advanced Child and Adolescent Psychotherapy U [0.50]

This course will consider newly emerging developments in child and adolescent psychotherapy, as well as issues of power relationships, cultural sensitivity and empirical support. In preparation, students should endeavor to complete two therapy cases prior to the commencement of the course.

*Prerequisite(s):* PSYC\*6580 and PSYC\*7993 (may be taken concurrently).

*Restriction(s):* This course is open only to graduate students in the CP:ADE field.

*Department(s):* Department of Psychology

### PSYC\*6630 Developmental Psychology U [0.50]

This course examines issues in the areas of cognitive, social, and emotional development. Specific research topics and theoretical issues concerning the nature of development are discussed.

*Department(s):* Department of Psychology

### PSYC\*6690 Cognitive Assessment of Children and Adolescents U [0.50]

This course considers standards, ethics, uses and interpretation of selected intelligence and other cognitive tests. Students administer tests, score, interpret and write reports under supervision.

*Restriction(s):* This course is open only to graduate students in the CP:ADE field.

*Department(s):* Department of Psychology

### PSYC\*6700 Personality and Social Assessment of Children and Adolescents U [0.50]

This course considers projectives, questionnaires, observations and interviews for assessing children's personality and behaviour. Students administer tests, score, interpret and write reports under supervision.

*Restriction(s):* This course is open only to graduate students in the CP:ADE field.

*Department(s):* Department of Psychology

### PSYC\*7991 CP:ADE Clinical Practicum I U [0.25]

This CP:ADE practicum is typically undertaken at the Center for Psychological Services, one day a week over a semester, to enhance skills introduced in other clinical courses. Expectations for the course will be based on the student's current level of clinical skill. Students will work with diverse clients, and gain knowledge of ethics and jurisprudence in a clinical setting.

*Restriction(s):* Restricted to students in the CP:ADE area of specialization

*Department(s):* Department of Psychology

### PSYC\*7992 CP:ADE Clinical Practicum II U [0.50]

This CP:ADE practicum is undertaken in a school board, psychological services department for two days a week over one semester. Students will develop clinical assessment skills with a diversity of clients, work with interdisciplinary teams, and apply knowledge of ethics and jurisprudence to educational settings. A passing grade and a satisfactory rating on the practical component must be achieved in PSYC\*6690 and PSYC\*6700 to enrol in this course.

*Prerequisite(s):* PSYC\*6010, PSYC\*6690, and PSYC\*6700

*Restriction(s):* Restricted to students in the CP:ADE area of specialization

*Department(s):* Department of Psychology

### PSYC\*7993 CP:ADE Clinical Practicum III U [1.00]

This CP:ADE practicum is undertaken in a children's mental health setting two days a week over two semesters. Students will develop complex assessment and therapy skills with diverse clients, work with interdisciplinary team, and apply knowledge of ethics and jurisprudence to mental health settings.

*Prerequisite(s):* PSYC\*6471 or PSYC\*7992

*Restriction(s):* Restricted to students in the CP:ADE area of specialization. Instructor consent required.

*Department(s):* Department of Psychology

### PSYC\*7994 Cognitive Behaviour Therapy Practicum F,W [1.00]

The CP:CBT practicum is typically undertaken at the Center for Psychological Training, and is intended to foster clinical psychology graduate student training in cognitive behaviour therapy (CBT). This practicum course will involve didactic and experiential components. Students will gain competency with the basics of CBT, gain capability with treatment manuals and undertake at least two ongoing therapy cases.

*Co-requisite(s):* PSYC\*6580

*Restriction(s):* Restricted to PhD students in the CP:ADE area of Psychology only. Instructor consent required.

*Department(s):* Department of Psychology

### PSYC\*8000 Clinical Internship U [0.00]

A mark of satisfactory (SAT) in this course indicates that a student in the Clinical Psychology: Applied Developmental Emphasis (CP:ADE) field has successfully completed a full year (1800-2000 hour) internship in an accredited clinical setting (e.g., CPA or APA) approved by the Director of Clinical Training for CP:ADE.

*Prerequisite(s):* Completion of all course work in the CP:ADE field, the PhD qualifying examination, and the PhD Thesis proposal at the time of application, one year in advance of beginning the clinical internship.

*Department(s):* Department of Psychology

## Industrial/Organizational Psychology

### PSYC\*7010 Recruitment and Selection: Methods and Outcomes U [0.50]

The course explores organizational issues in the recruitment and selection of new employees. Topics may include: individual differences, human rights, survey-based job analysis, recruitment methods and outcomes, selection methods and outcomes, hiring, decision making and employee placement/classification.

*Department(s):* Department of Psychology

### PSYC\*7020 Employee Performance U [0.50]

This course focuses on issues that relate to employee performance. Individuals and organizations are interested in maximizing the contributions of employees at work. This course focuses on performance-based job analysis, criterion theory, performance management/appraisal, employee socialization, compensation, benefits, technology, and labour relations.

*Department(s):* Department of Psychology

### PSYC\*7030 Work Attitudes and Behaviour U [0.50]

This course examines micro-level influences on organizational behaviour. Topics may include: organizational commitment, job satisfaction, emotions, other work attitudes and attitude change, organizational citizenship behaviours, withdrawal behaviours, employee well-being, deviance, and work-life integration.

*Department(s):* Department of Psychology

### PSYC\*7040 Social Processes in the Workplace U [0.50]

This course examines social processes in the workplace. Topics may include: groups, teams, and intergroup processes; justice; diversity in the workplace; prejudice and discrimination; harassment and unethical behaviour; climate, culture change; and, organizational development.

*Department(s):* Department of Psychology

**PSYC\*7050 Research Seminar in Industrial/Organizational Psychology U [0.00]**

This course will expose graduate students to some of the major theories, issues, and methodologies driving research in the field of Industrial/Organizational psychology. Students will learn to critically evaluate presentations by researchers in this field, as well as to communicate the results of their own research, in both written and an oral format. All students are required to enroll in this course.

*Restriction(s):* Psychology students only.

*Department(s):* Department of Psychology

**PSYC\*7080 Consulting in Industrial/Organizational Psychology U [0.00]**

The course introduces students to consulting in I/O Psychology through actual consulting projects with local organization. Topics include: marketing consulting services, understanding consulting, client and project management. Specific projects will vary from semester to semester based on work secured with local organizations (e.g. training, surveys, coaching).

*Prerequisite(s):* Registration in the graduate IO psychology program and permission of the Instructor.

*Department(s):* Department of Psychology

**PSYC\*7130 Introduction to Industrial/Organizational Psychology U [0.50]**

This course introduces graduate students to a broad range of topics in Industrial/Organizational psychology. It emphasizes researcher-practitioner issues, consumer behaviour, professionalism, ethics, and theory building. As well, graduate students will learn about contemporary issues in I-O Psychology.

*Department(s):* Department of Psychology

**PSYC\*7140 Industrial/Organizational Psychology Special Topic Doctoral Research Seminar U [0.50]**

Participants investigate a specific area of Industrial/Organizational psychology. They critically review past and current research, including theory development and empirical findings. Participants work together to integrate past theory and findings, to note inconsistencies in the literature, and to identify promising areas for future investigations.

*Prerequisite(s):* PSYC\*7130

*Department(s):* Department of Psychology

**PSYC\*7160 Employee Development: Methods and Outcomes U [0.50]**

This course explores development in an organization context. Employee learning and development is a key focus for employees and organizations. This course covers functional job analysis, career development, succession management, multi-source feedback, training, coaching/mentoring and employee counseling.

*Department(s):* Department of Psychology

**PSYC\*7170 Industrial/Organizational Psychology Doctoral Research Internship I U [0.50]**

Participants work with an Industrial Organizational faculty member to conduct research on a topic of mutual interest (other than their doctoral research). They collect and/or analyze data and write up results with the goal of producing a conference presentation and/or a quality publication manuscript.

*Prerequisite(s):* PSYC\*7130

*Co-requisite(s):* PSYC\*7140

*Restriction(s):* Instructor consent required.

*Department(s):* Department of Psychology

**PSYC\*7180 Industrial/Organizational Psychology Doctoral Research Internship II U [0.50]**

Participants work with an Industrial Organizational faculty member to conduct research on a topic of mutual interest (other than their doctoral research). They collect and/or analyze data and write up results with the goal of producing a conference presentation and/or a quality publication manuscript.

*Prerequisite(s):* PSYC\*7130, PSYC\*7140, PSYC\*7170

*Restriction(s):* Instructor consent required.

*Department(s):* Department of Psychology

**PSYC\*7190 Work Motivation and Leadership U [0.50]**

This course examines theories, research, and application of work motivation and leadership within an organizational context. The course will include a description of classic and contemporary theories of work motivation and leadership, a critical evaluation of the research findings, and a discussion of the application of the research findings to the work environment.

*Restriction(s):* Psychology students only.

*Department(s):* Department of Psychology

## Public Health

The Master of Public Health (MPH) program is a five-semester professional degree with concentration in epidemiology, environmental public health, infectious diseases, and zoonotic, foodborne and waterborne diseases. This program is of interest to individuals holding an undergraduate degree in science or applied science seeking a career in public health. A Graduate Diploma is also offered for those individuals with public health-related experience that wish to increase their knowledge or acquire focused learning.

### Administrative Staff

#### Graduate Program Coordinator

Andrew Papadopoulos (203 McNabb House, Ext. 53894)  
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#### Graduate Program Assistant

Ariah Easley (102 Population Medicine, Ext. 54005)  
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#### Graduate Program Assistant

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### Graduate Faculty

#### Olaf Berke

Associate Professor, Population Medicine

#### Patrick Boerlin

Associate Professor, Pathobiology

#### Catherine Dewey

Professor, Population Medicine

#### Robert Friendship

Professor, Population Medicine

#### Amy Greer

Assistant Professor, Population Medicine

#### Sherilee Harper

Assistant Professor, Population Medicine

#### Claire Jardine

Assistant Professor, Pathobiology

#### Andria Jones-Bitton

Assistant Professor, Population Medicine

#### Scott A. McEwen

Professor, Population Medicine

#### Jennifer McWhirter

Assistant Professor, Population Medicine

#### Paula I. Menzies

Associate Professor, Population Medicine

#### Eva Nagy

Professor, Pathobiology

#### Andrew Papadopoulos

Associate Professor, Population Medicine and Coordinator, Master of Public Health Program

#### David Pearl

Associate Professor, Population Medicine

#### Andrew Peregrine

Associate Professor, Pathobiology

#### John Prescott

Professor, Pathobiology

#### Jan Sargeant

Professor, Population Medicine

#### Elizabeth Stone

Professor and Dean, Ontario Veterinary College

#### Scott Weese

Professor, Pathobiology

### MPH Program

The objective of the MPH program is to prepare students for careers in public health. The curriculum is based on the core competencies for public health in Canada. Required courses will prepare students in all aspects of public health practice. Additional elective courses will provide students with the opportunity to develop added strength in specific areas, namely epidemiology, environmental public health, infectious disease, and zoonotic, foodborne, and water-borne diseases. Courses will incorporate case-based material and community-engaged exercises to provide students with the opportunity to use a variety of problem-solving and communication skills. Further information can be found at the MPH program website. <http://www.ovc.uoguelph.ca/mph/>

### Admission Requirements

Eligible applicants include those with an honours BSc in Biomedical Sciences, Biological Sciences or Public Health, or those with a DVM, BScN or MD professional degrees (or equivalents). Students with an honours degree without a biological or health focus will be required to complete the distance education BSc course PATH\*3610 Principles of Disease prior to enrolling in the degree program. Candidates should have earned a B+ average in their honours BSc degree or at least a B- average in a professional degree (e.g., BScN, DVM, or MD). All applicants should submit a one-page statement of interest and career goals in public health. Students will be admitted into the Fall semester. Additional information can be found at: <https://ovc.uoguelph.ca/mph/prospective-students>

### Degree Requirements

The MPH program at the Ontario Veterinary College will typically consist of five consecutive semesters of full-time study. Full-time students will take three semester-length courses for four semesters (total 12 courses), the Public Health Capstone course and a 12 to 16-week practicum in a public health practice setting. Students will begin their program in September. Students can complete the program in four semesters if they choose by adding one additional elective to their course load during each of the Fall and Winter first-year and Fall second-year semesters (four courses / semester).

Students will complete at least six (0.50 credit) courses before they begin the practicum between May and August inclusive. The Practicum will provide an opportunity to add function to the knowledge base achieved during the didactic portion of the program. A paper, a poster and public presentation developed from data gathered during the Practicum will illustrate the cumulative experience in the Public Health Capstone course. This is a residency program as core courses and most electives are not offered through distance education. Students may enroll part-time while they continue to work in their public health or regulatory careers. Part-time students will normally take one or two courses per semester. Please note that since this is a non-thesis based degree, applicants are not required to obtain an advisor prior to applying. One will be assigned once students have been admitted into the program.

### Graduate Diploma

This stand-alone diploma consists of four courses, including Applied Public Health Research, at least two other required courses and one elective course. Students may request a transfer from the Graduate Diploma into the MPH and if accepted, will receive credit for the courses taken. Students interested in this option must apply to the MPH prior to initiating graduation procedures from the Graduate Diploma.

### Admission Requirements

Eligible applicants include those with an honours BSc in Biomedical Sciences, Biological Sciences, or Public Health, or those with a DVM, BScN or MD professional degrees (or equivalents). Students with an honours degree without a biological or health focus will be required to complete the distance education BSc course PATH\*3610 Principles of Disease prior to enrolling in the degree program. Candidates should have earned a B average in an honours degree or in a professional degree. All applicants should submit a one-page statement of interest and career goals in public health. Students will be admitted into the Fall semester. Additional information can be found at <https://ovc.uoguelph.ca/mph/prospective-students>

### Diploma Requirements

The Graduate Diploma program at the Ontario Veterinary College consists of four courses, including Applied Public Health Research, at least two required courses, and one elective course.

### Collaborative Specializations

#### International Development Studies

The Department of Population Medicine participates in the MPH collaborative specialization in International Development Studies (IDS). Students in this option must register in the MPH program in the department and IDS. Those faculty members whose research and teaching expertise includes aspects of international development studies may serve as advisors for MPH students. Please consult the International Development Studies listing for a detailed description of the MPH collaborative specialization and the special additional requirements for each of the participating departments.

### Courses

#### Required Courses

PABI*6500	[0.50]	Infectious Diseases and Public Health
POPM*6200	[0.50]	Epidemiology I
POPM*6510	[0.50]	Community Health Promotion
POPM*6520	[0.50]	Introduction to Epidemiological and Statistical Methods
POPM*6530	[0.50]	Health Communication
POPM*6540	[0.50]	Concepts in Environmental Public Health
POPM*6550	[0.50]	Public Health Policy and Systems
POPM*6560	[1.00]	Public Health Practicum
POPM*6570	[0.00]	Public Health Capstone
POPM*6580	[0.50]	Public Health Administration

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**Electives**

Four electives (or 2.0 credits) are required. Choose at least two electives from the following list. The remaining course may also be selected from this list or from those listed elsewhere in the Graduate Calendar. Students taking Public Health Practicum II (1.0 credit) are required to take only two additional 0.5 credit elective courses. The MPH program coordinator must approve all electives in advance.

EDRD*6100	[0.50]	Disaster Planning and Management
EDRD*6690	[0.50]	Program Evaluation
PABI*6550	[0.50]	Epidemiology of Zoonoses
POPM*6210	[0.50]	Epidemiology II
POPM*6350	[0.50]	Safety of Foods of Animal Origins
POPM*6950	[0.50]	Studies in Population Medicine
POPM*6590	[1.00]	Public Health Practicum II
POPM*6600	[0.50]	Applied Public Health Research

## Public Issues Anthropology

The Department of Sociology and Anthropology at the University of Guelph offers a program leading to an [MA in Public Issues Anthropology](#). See the [department website](#) for more details on the program and admissions requirements.

### Administrative Staff

#### Chair

Elizabeth Finnis (626 MacKinnon, Ext. 56527)  
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#### Public Issues Anthropology Graduate Program Coordinator

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#### Graduate Program Assistant

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### Graduate Faculty

#### Elizabeth Finnis

BA McMaster, MA Western, PhD McMaster - Associate Professor

#### Edward J. Hedican

BA Lakehead, MA McMaster, PhD McGill - Professor

#### Satsuki Kawano

BA Keio, MA Minnesota, PhD Pittsburgh - Professor

#### Belinda Leach

BA Carleton, MA, PhD Toronto - Professor

#### Thomas (Tad) McIlwraith

BA Toronto, MA UBC, PhD University of New Mexico - Assistant Professor

#### Renée Sylvain

BA Wilfrid Laurier, MA, PhD Toronto - Associate Professor

### MA Program

#### Admission Requirements

Applicants must possess an Honours BA (4 years) degree or its equivalent with at least a 'B+' average in the final two undergraduate years. Students who do not meet departmental requirements, e.g., students whose undergraduate degree does not include basic courses in sociology and/or anthropology, may be admitted provisionally.

#### Degree Requirements

The MA program allows students to become actively involved in advanced studies and research in Anthropology. Students enrol in one of two study options: 1) thesis, or 2) course work and major research paper.

#### Thesis

Students must complete a minimum of 2.0 credits, conduct research, and write a thesis.

#### Course Work and Major Research Paper (MRP)

Students must complete a minimum of 4.0 credits (including 1.0 credit the Major Paper course ANTH\*6660) and write a major paper.

All students are required to attend a Public Issues Anthropology seminar (ANTH\*6000) in their first semester. They must also master basic theory and methodological skills. This is normally fulfilled through the successful completion of the courses ANTH\*6080 and ANTH\*6140. Students typically begin their studies in the Fall semester.

#### Collaborative Specializations

#### International Development Studies

The Department of Sociology and Anthropology participates in the MA collaborative specialization in International Development Studies (IDS). Students in this option register in an MA program in the department and IDS. Those faculty members whose research and teaching expertise includes aspects of international development studies may serve as advisors for MA students. Please consult the International Development Studies listing for a detailed description of the MA collaborative specialization and the special additional requirements for each of the participating departments.

### Courses

#### Core courses

##### ANTH\*6140 Qualitative Research Methods W [0.50]

An examination of the methods of qualitative research, including participant observation and unstructured interviews, as well as the ethical considerations of fieldwork. Other topics, such as comparative and historical methods, may be included.

*Department(s):* Department of Sociology and Anthropology

##### ANTH\*6080 Anthropological Theory F [0.50]

An examination of classical and contemporary anthropological theory, including an emphasis on the most recent directions in the discipline.

*Department(s):* Department of Sociology and Anthropology

##### ANTH\*6000 Public Issues Anthropology F [0.50]

This course will examine the interface between anthropological and public understandings of public issues, with sensitivity to the presence or absence of anthropological insights. The course will assure that students become well versed in how to synthesize the resources of various branches of the discipline.

*Restriction(s):* Restricted to incoming students in the program.

*Department(s):* Department of Sociology and Anthropology

#### Elective courses

##### ANTH\*6270 Diversity and Social Equality U [0.50]

This course will examine a range of approaches used in the study of intergroup relations, with special emphasis on struggles over influence and power. Students will acquire a deeper understanding of the complex intersection, as well as the overlap among forms of identity and group mobilization based on ethnic, linguistic, regional, class, gender, racial and other forms of social division. The course may also cover native issues and policies related to multiculturalism, equity and local or regional autonomy.

*Department(s):* Department of Sociology and Anthropology

##### ANTH\*6420 Global Agro-Food Systems, Communities and Rural Change U [0.50]

This course will reflect recent sociological interests in food studies and global agro-food systems, resources and the environment, community sustainability, rural-urban linkages, the transnationalization of labour regimes, and social movements in the rural context. The course will encourage students to take a comparative and historical approach, focussing on cross-national and inter-regional studies where possible, and to examine how class, gender, race and ethnicity play out in each particular substantive topic comprising the rural field.

*Department(s):* Department of Sociology and Anthropology

##### ANTH\*6460 Gender and Development F [0.50]

Cross-cultural and historical changes in gender relations and the roles/positions of women brought about by industrialization and the development of the world system. Critical examination of the predominant theories of gender relations, in so far as these inform development research and action in societies with different socio-economic systems. Introduction to the latest theories and research in the area of women and development, as well as with social and political actions undertaken by women themselves. This is one of the two alternative core courses for the International Development Studies collaborative specialization.

*Department(s):* Department of Sociology and Anthropology

##### ANTH\*6480 Work, Gender and Change in a Global Context U [0.50]

This course will consider some of the theoretical frameworks available for examining work, workers and work places in the context of globalization, economic restructuring, and shifts in public policy. Using case studies of particular work worlds, the course may include topics such as changing patterns of work and employment in comparative contexts, labour regimes, industrial and organizational change, organizations and protest, education for work, and the regulation of work. The course will focus on the dialectical relationship between the configurations of gender, class, race and ethnicity and the transformation of work.

*Department(s):* Department of Sociology and Anthropology

##### ANTH\*6550 Selected Topics in Theory and Research U [0.50]

This course will be offered with varying content focusing on theory or research.

*Department(s):* Department of Sociology and Anthropology

##### ANTH\*6600 Reading Course U [0.50]

A program of directed reading, complemented with the writing of papers or participation in research. Reading courses are arranged by students through their advisors or advisory committees and must be approved by the chair of the department. This course may be repeated provided different content is involved.

*Department(s):* Department of Sociology and Anthropology

##### ANTH\*6660 Major Paper U [1.00]

The major paper is an extensive research paper for those who do not elect to complete a thesis. It may be taken over two semesters.

*Department(s):* Department of Sociology and Anthropology

## Rural Planning and Development

Rural Planning and Development has a four-part mission of teaching, research, training and outreach. The MSc programs are offered in the following fields:

- Canadian Rural Planning and Development
- International Rural Planning and Development

### Administrative Staff

#### Director, SEDRD

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#### Graduate Program Coordinator

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#### Graduate Program Assistant

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### Graduate Faculty

#### Nicholas Brunet

BSc McGill, MSc Guelph, PhD McGill - Assistant Professor

#### Wayne J. Caldwell

BA, MA Western Ontario, PhD Waterloo, MCIP - Professor

#### John F. Devlin

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#### John E. FitzGibbon

BA McMaster, MSc Wales, PhD McGill, MCIP - Professor

#### John FitzSimons

BA Wales, MA McMaster, PhD Western Ontario - Associate Professor

#### Ryan Gibson

BA, MRD Brandon, PhD Memorial - Assistant Professor

#### Helen Hambly Odame

BA Toronto, MES, PhD York - Associate Professor

#### Al Lauzon

BA, MSc, Guelph, EdD Toronto - Professor and Acting Director

#### Sheri Longboat

BES Waterloo, BEd Brock, MA, PhD Wilfrid Laurier - Assistant Professor

#### James P. Mahone (retiring August 31, 2017)

BSc US Coast Guard Academy (Connecticut), PhD Michigan - Associate Professor

#### Nonita T. Yap (retiring August 31, 2017)

BSc San Carlos (Philippines), MES Dalhousie, PhD Alberta - Professor

### Associated Graduate Faculty

#### F. Harry Cummings

BA Western Ontario, MA, PhD Clark, MCIP - Retired Professor, School of Environmental Design & Rural Development, Univ of Guelph

### MSc (Planning) Program

Rural Planning and Development provides the opportunity for graduate study, research and professional development in: 1) Canadian rural planning and development; or 2) International rural planning and development. The program leads to an MSc (Planning) degree. It is a professionally accredited (Canadian Institute of Planners) program that requires substantial commitment to professional performance and ethics.

Graduate students in the MSc (Planning) program find employment in rural planning departments, governments, non-governmental organizations, and private consulting firms in Canada and overseas. Graduates are prepared for both local development and planning as well as regional, provincial and national-level research and policy planning in international and Canadian contexts.

The program goal is to ensure that students have the knowledge and skill to conduct interdisciplinary research and, in a professional capacity, guide processes of change in rural planning and development.

Where appropriate, faculty from other academic units participate in an advisory capacity in students' research programs.

### Admission Requirements

The program is open to qualified graduates from all disciplines including geography, international development, sociology, agriculture, environmental studies, landscape architecture, economics and planning. Applicants are required to demonstrate their specific interest in the program and relevant work experience in rural planning and development. A four-year honours degree with a B- average is considered the normal basis for admission.

### Degree Requirements

Students enrol in one of two study options: 1) course work or course work and major research paper, or 2) thesis.

### Canadian Rural Planning and Development

This field offers an all course work option; major research paper (MRP) option and a thesis option. All three are aimed at providing substantive professional, contextual and specialized knowledge and skill in the domestic rural planning and development context.

All students enrolled in this field are required to complete a set of core courses that provide a foundation for rural planning and development research and practice in the Canadian context.

#### Course Work

Students must complete:

RPD*6170	[0.50]	Rural Research Methods
RPD*6380	[0.50]	Application of Quantitative Techniques in Rural Planning and Development
RPD*6240	[0.50]	Planning and Development Theory
RPD*6260	[0.50]	Land Use Planning Law
RPD*6250	[0.50]	Foundations in Rural Planning Practice

In addition the student is required to complete an additional nine (9) 0.5 credit elective courses in consultation with their advisory committee.

#### Course Work and Major Research Paper (MRP)

Students must complete:

RPD*6170	[0.50]	Rural Research Methods
RPD*6380	[0.50]	Application of Quantitative Techniques in Rural Planning and Development
RPD*6240	[0.50]	Planning and Development Theory
RPD*6260	[0.50]	Land Use Planning Law
RPD*6250	[0.50]	Foundations in Rural Planning Practice
RPD*6360	[1.00]	Major Research Paper

In addition the student is required to complete an additional seven (7) 0.5 credit elective courses in consultation with their advisory committee.

#### Thesis

Students must complete:

RPD*6170	[0.50]	Rural Research Methods
RPD*6380	[0.50]	Application of Quantitative Techniques in Rural Planning and Development
RPD*6240	[0.50]	Planning and Development Theory
RPD*6260	[0.50]	Land Use Planning Law
RPD*6250	[0.50]	Foundations in Rural Planning Practice

In addition the student is required to complete an additional five (5) 0.5 credit elective courses in consultation with their advisory committee.

Students may develop an area of specialization with their advisory committees through course work, selection of elective courses, and student research leading to the major research paper or thesis. An internship is not a field requirement but is strongly recommended. The program makes available a set of options to assist in developing the area of emphasis.

In the delivery of the Canadian rural planning and development field, the program draws on courses and faculty from other units on campus as well as on the resources of the school. The field of rural planning and development (Canadian) is formally recognized by the Canadian Institute of Planners, and three faculty within the program along with two faculty from other programs within the School of Environmental Design and Rural Development are Registered Professional Planners.

### International Rural Development Planning

This field prepares students for research and practice in international rural planning and development. Students may choose the course work option; major research paper (MRP) option or the thesis option. An internship is not a field requirement but is strongly recommended.

All students enrolled in this field are required to complete a set of core courses and electives that provide a foundation for international rural planning and development research and practice.

#### Course Work

Students must complete:

RPD*6170	[0.50]	Rural Research Methods
RPD*6380	[0.50]	Application of Quantitative Techniques in Rural Planning and Development
RPD*6240	[0.50]	Planning and Development Theory
RPD*6260	[0.50]	Land Use Planning Law
RPD*6250	[0.50]	Foundations in Rural Planning Practice

In addition the student is required to complete an additional nine (9) 0.5 credit elective courses in consultation with their advisory committee.

#### Course Work and Major Research Paper (MRP)

Students must complete:

RPD*6170	[0.50]	Rural Research Methods
RPD*6380	[0.50]	Application of Quantitative Techniques in Rural Planning and Development
RPD*6240	[0.50]	Planning and Development Theory

RPD*6030	[0.50]	International Rural Development Planning: Principles and Practices
RPD*6291	[0.50]	Rural Development Administration
RPD*6360	[1.00]	Major Research Paper

In addition the student is required to complete an additional seven (7) 0.5 credit elective courses in consultation with their advisory committee.

### **Thesis**

Students must complete:

RPD*6170	[0.50]	Rural Research Methods
RPD*6380	[0.50]	Application of Quantitative Techniques in Rural Planning and Development
RPD*6240	[0.50]	Planning and Development Theory
RPD*6030	[0.50]	International Rural Development Planning: Principles and Practices
RPD*6291	[0.50]	Rural Development Administration

In addition the student is required to completed an additional five (5) 0.5 credit elective courses in consultation with their advisory committee.

Students may develop an area of specialization with their advisory committees through course work, selection of elective courses, student research. An internship is not a field requirement but is strongly recommended. The program makes available a set of options to assist in developing the area of emphasis.

In the delivery of the International rural planning and development field, the program draws on courses and faculty from other units on campus as well as on the resources of the School. The field of rural planning and development (International) is formally recognized by the Canadian Institute of Planners, and three faculty within the program along with two faculty from other programs within the School of Environmental Design and Rural Development are Registered Professional Planners.

### **MPLAN Program**

Rural Planning and Development provides the opportunity for graduate study, applied research and professional development in: 1) Canadian rural planning and development; or 2) International rural planning and development. The program leads to a Master of Planning (MPLAN) degree.

This 1 year program is geared towards more experienced graduates working for an agency or non-governmental organization abroad or in Canada; or for mature Canadian planners working in a municipal planning environment, for other levels of government, in professional consulting, non-governmental organizations or other contexts or for graduates of related professional programs. It is explicitly designed for individuals wishing to upgrade their professional training to the Masters level without necessarily withdrawing from the work force for an extended period of time.

This degree may also be completed at a distance. Please consult with the program's Graduate Program Coordinator for more details.

### **Admission Requirements**

The program is open to:

1. Qualified graduates from relevant disciplines (minimum B- average) with 4-5 years of relevant experience. Relevant experience is determined by the admissions committee.
2. Graduates from a professional program in Planning, Landscape Architecture, Architecture or Engineering (minimum B- average).

All applicants are required to demonstrate their specific interest in the program and their work and educational experience relating to rural planning and development.

### **Degree Requirements**

- Two (2.0) credits earned from the MSc (Planning) course list related to their research interest, chosen with the advice of their Advisory Committee.
- Senior Planning and Development (listed as RPD\*6290)
- A 0.5 credit earned from an open elective.
- Course selection will emphasize either the International field or the Canadian field.
- The candidate will also complete a Major Research Paper.

### **Collaborative Specializations**

#### **International Development Studies**

Rural Planning and Development participates in the International Development Studies (IDS) collaborative specialization. The MSc degree for students in this program will have the specialist designation rural planning and development: international development studies. Please consult the [International Development Studies listing](#) for a detailed description of the collaborative specialization including the special additional requirements for each of the participating departments.

### **Courses**

#### **Core Courses**

<b>RPD*6030 International Rural Development Planning: Principles and Practices U [0.50]</b>
This course presents the scope and nature of international development planning and alternative roles for development planners; has a rural emphasis; reviews the evolution of development planning from macroeconomic beginnings to more integrated local planning approaches; examines the development planning process and its organizational and spatial dimensions; compares policy, program, project, sectoral and integrated area planning; and compares rural development planning in market, mixed and state-driven societies. <i>Department(s):</i> School of Environmental Design and Rural Development
<b>RPD*6170 Rural Research Methods U [0.50]</b>
The course provides rural planning and development professionals with a number of theoretical frameworks and practical approaches to problem solving in rural Canadian and international contexts. The course content provides an introduction to hypothesis development, data collection, analytical frameworks, research management, and information synthesis and presentation methodologies that are appropriate to the practicing rural planner and developer. It views the roles of the researcher and research as interventionist and intervention in the rural community. Research methods are discussed as an integral and supporting part of the planning and development process. <i>Department(s):</i> School of Environmental Design and Rural Development
<b>RPD*6240 Planning and Development Theory U [0.50]</b>
Examines basic concepts, theories and perspectives in rural planning and development. A conceptual examination of 'rural', 'planning' and 'development' precedes an examination of how rural planning and development is viewed from alternative, often conflicting theories of rural change and planned intervention. The implications for practice are discussed. <i>Department(s):</i> School of Environmental Design and Rural Development
<b>RPD*6250 Foundations in Rural Planning Practice F [0.50]</b>
This course provides an introduction to rural planning practice. This includes: i) Concepts in Public Administration - The structure, responsibility and functions of public sector administration and government. ii) The workings of local government. iii) Rural Planning Practice - An introduction to planning and development in rural regions and small municipalities. <i>Department(s):</i> School of Environmental Design and Rural Development
<b>RPD*6260 Land Use Planning Law U [0.50]</b>
An introduction to the legal tools used to regulate the use of land and other resources. Zoning, subdivision controls, development control, land banking, expropriation, planning appeals, official maps, etc. An intensive study of the Ontario Planning Act and related legislation. <i>Department(s):</i> School of Environmental Design and Rural Development
<b>RPD*6291 Rural Development Administration U [0.50]</b>
This course explores the administration of rural development by considering the main organizational types delivering rural programs. The structure and behaviour of these organizations, their interactions, and their respective sectors will be considered. Students will also be introduced to administrative planning tools. <i>Department(s):</i> School of Environmental Design and Rural Development
<b>RPD*6360 Major Research Paper U [1.00]</b>
Students not pursuing the thesis route must satisfactorily complete a Major Research Paper. The paper will be supervised by a faculty committee. Content of the paper will generally focus on the placement of a problem in rural planning and development practice using appropriate methodological and analytical procedures. Note: This is a one semester course and must be completed in the semester of registration. <i>Restriction(s):</i> For Major Paper option only. Instructor consent required. <i>Department(s):</i> School of Environmental Design and Rural Development
<b>RPD*6380 Application of Quantitative Techniques in Rural Planning and Development U [0.50]</b>
Analysis and application of standard quantitative, statistical and computer-based techniques utilized in rural planning and development. Problems of data collection, analysis and interpretation. <i>Department(s):</i> School of Environmental Design and Rural Development

## Elective Courses

Students are to select their electives from the following list of RPD and EDRD knowledge and skills courses. This list of electives is modified from time to time by the RPD Graduate Program Committee, and the student should contact the Graduate Program Committee for the current list of available electives. An RPD core course from outside your field can also be taken as an elective. Two electives may be selected from other courses offered within SEDRD (e.g. CDE or LARC) or by other University departments which are not included below.

### **RPD\*6070 Project Development: Principles, Procedures, and Selected Methods U [0.50]**

This course introduces students to the principles, procedures and methods in developing a project. It examines the project cycle: identification, preparation, appraisal, implementation/supervision, monitoring and evaluation. It gives an understanding of the major methods involved and teaches selected methods. The focus is on the international, rural context and on small non-farm projects: small industries, small physical infrastructure and social projects.

*Department(s):* School of Environmental Design and Rural Development

### **RPD\*6080 Environment and Development: Biophysical Resources and Sustainable Development in Rural Environments U [0.50]**

This course will examine the problems and potential for ecologically sustainable development in the context of rural development planning particularly in the Third World environments. The course critically examines the strategic planning approaches and methods which involve the interaction between social systems and natural ecosystems in the context of planned intervention and change in rural environments.

*Department(s):* School of Environmental Design and Rural Development

### **RPD\*6220 Planning and Development Policy Analysis U [0.50]**

Planning and development policy has experienced a significant evolution. This course examines the history of policy, and the theory, methods and processes of policy development and governance in planning and management of environment and resources.

*Department(s):* School of Environmental Design and Rural Development

### **RPD\*6280 Advanced Planning Practice W [0.50]**

This course explores current issues, techniques, legislation and processes that are relevant to rural planning practice. A number of specific municipal (local and regional) rural planning examples will be presented. Comparisons between different jurisdictions will be reviewed. Students will be engaged in project-based learning.

*Prerequisite(s):* RPD\*6250

*Department(s):* School of Environmental Design and Rural Development

### **RPD\*6290 Special Topics in Rural Planning and Development U [0.50]**

Selected study topics focus on the nature of rural planning and development issues and/or practices in Canadian and/or International small communities and rural environments. Among the topics which may be addressed are: rural land use planning, ecological restoration, gender analysis in development planning, GIS in agricultural development, micro-credit, physical/site planning and design, project management.

*Restriction(s):* Instructor consent required.

*Department(s):* School of Environmental Design and Rural Development

### **RPD\*6310 Environmental Impact Assessment U [0.50]**

This course deals with the role of environmental impact assessments and statements in the planning, development and operation of resource projects. Topics discussed include the philosophical and institutional basis for environmental impact assessments, methods used and the effects of such assessments on resource development projects.

*Department(s):* School of Environmental Design and Rural Development

### **RPD\*6320 Water Resource Management U [0.50]**

The course provides an assessment of the processes and principles which underlie comprehensive water resource planning and integrated basin management. It also undertakes to evaluate current practice in the context of integrated planning. There is extensive use of Canadian and international practice.

*Department(s):* School of Environmental Design and Rural Development

### **RPD\*6370 Economic Development Planning and Management for Rural Communities U [0.50]**

Theories and perspectives of local economic development, particularly community-based planning for rural economic development. Economic development within a community development framework, and challenges of sustainable development. Interdisciplinary perspectives and alternative approaches to professional planning practice, strategic planning, management and organizational design/development issues. Alternative economic concepts and perspectives are critically examined. Includes international case studies.

*Department(s):* School of Environmental Design and Rural Development

### **RPD\*6390 Rural Social Planning U [0.50]**

This course will provide students who have an interest in social development with an avenue for linking that interest to the policy, planning and intervention process.

*Department(s):* School of Environmental Design and Rural Development

### **RPD\*6410 Readings in Rural Planning U [0.50]**

A program of supervised independent study related to the student's area of concentration. Nature and content of the readings course are agreed upon between the student and the instructor, and are subject to the approval of the student's advisory committee and graduate committee.

*Restriction(s):* Instructor consent required.

*Department(s):* School of Environmental Design and Rural Development

### **RPD\*6450 Recreation and Tourism Planning and Development U [0.50]**

This course is intended to instruct the student in the principles of planning for recreation and tourism development. Emphasis is placed on the economic and social benefits and costs that accrue from tourism and recreation development. Planning principles are applied to this context.

*Department(s):* School of Environmental Design and Rural Development

EDRD*6000	[0.50]	Qualitative Analysis in Rural Development
EDRD*6050	[0.50]	Farming Systems Analysis and Development
EDRD*6100	[0.50]	Disaster Planning and Management
EDRD*6630	[0.50]	Regional Planning
EDRD*6690	[0.50]	Program Evaluation

## Rural Studies

Rural Studies core faculty are from within the School of Environmental Design & Rural Development (Capacity Development and Extension, Landscape Architecture, Rural Planning and Development).

The program focuses on two fields:

- **Sustainable Rural Communities** Sustainable rural communities are characterized by long-term well-being based on the integration of economic, social and environmental factors in their planning and activities. Four sectors of sustainable rural communities have been designated: environment and sustainability, social structure and processes, human resource development, and sustainable rural economic development.
- **Sustainable Landscape Systems** The sustainable landscape systems field examines structure, process, and change in the rural landscape through research on bio-physical and socio-cultural sectors.

A number of different disciplines are represented and an interdisciplinary approach is taken to integrate across subject areas. Students may choose among fields and choose a sector within the field for relatively more-intensive study.

### Administrative Staff

#### Director, School of Environmental Design and Rural Development (SED RD)

Sean Kelly (104 Landscape Architecture, Ext. 56870)  
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#### Graduate Program Coordinator (until August 31, 2017)

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#### Graduate Program Coordinator (effective September 1, 2017)

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### Graduate Faculty

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#### Wayne Caldwell

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BLA Guelph, MLA Minnesota, PhD Michigan, ASLA - Associate Professor, SED RD

#### John Devlin

BA Dalhousie, MA Calgary, MA Carleton, PhD Guelph - Associate Professor, SED RD

#### John FitzGibbon

BA McMaster, MSc Wales, PhD McGill - Professor, SED RD

#### John FitzSimons

BA Wales, MA McMaster, PhD Western - Associate Professor, SED RD

#### Ryan Gibson

BA, MRD Brandon, PhD Memorial - Assistant Professor

#### Helen Hambly-Odame

BA Toronto, ME.S., PhD York - Associate Professor, SED RD

#### Sean Kelly

BLA, MSc Guelph, CSLA, OALA, ASLA, OPPI - Associate Professor, SED RD

#### Karen Landman

BLA, MSc Guelph, PhD Queen's, OPPI - Associate Professor, SED RD

#### Allan C. Lauzon

BA, MSc Guelph, EdD Toronto - Professor, SED RD

#### Sheri Longboat

BES Waterloo, BEd Brock, MA, PhD Wilfrid Laurier - Assistant Professor

#### Jim Mahone (retiring December 31, 2017)

BSc U.S. Coast Guard Academy (Connecticut), PhD Michigan State - Associate Professor, SED RD

#### Nathan H. Perkins

BLA, MLA Illinois, PhD Wisconsin, FASLA - Associate Professor, SED RD

#### Nonita T. Yap (retiring August 31, 2017)

BSc San Carlos (Philippines), MES Dalhousie, PhD Alberta - Professor, SED RD

### Associated Graduate Faculty

#### F. Harry Cummings

BA Western, MA, PhD Clark - Retired Faculty, School of Environmental Design & Rural Development, Univ of Guelph

#### Glen C. Filson

BA, MEd Saskatchewan, PhD Toronto - Retired Faculty, School of Environmental Design and Rural Development, Univ of Guelph

## PhD Program

The PhD program is offered in the following fields: 1) sustainable rural communities; and 2) sustainable landscape systems. The objective of the program in Rural Studies is to provide opportunities for advanced studies and research on the integration of socio-cultural and bio-physical components for capacity development, design, or planning of landscape systems and rural communities. Graduates are prepared to become leading specialists in addressing sustainable landscapes and rural communities issues. Interdisciplinary research is emphasized, building on the disciplines of capacity development and extension, landscape architecture, and rural planning and development within SED RD.

### Admission Requirements

To be considered for admission, an applicant must have a master's degree (or the equivalent) from a recognized university in a relevant discipline. Master's graduates in a range of humanities, social-science and applied-science disciplines are eligible for consideration for admission. As examples, master's graduates in geography, sociology, planning, landscape architecture, environmental science, capacity development and extension, and international development may be particularly suitable. Applicants who have not completed courses relevant to rural studies or gained experience in rural communities may be required to do so prior to admission or as part of initial phases of the PhD program.

The program's admission policy is governed by the availability of graduate advisors and other resources and by the need to admit applicants from a variety of disciplines and backgrounds. The interaction of students with diverse backgrounds will greatly enhance the interdisciplinary approaches in the program. The program also seeks to achieve the significant participation of women and aboriginal people from North America and international students. The co-ordinator of the program receives applications directly from prospective students or through prospective advisors and ensures that application files are complete for review by the admission committee. The committee then consults with prospective advisors and recommends applicants for admission to the Office of Graduate Studies. Applicants should consult the coordinator for the deadline for admission.

### Degree Requirements

#### Advisory Committee

Each doctoral student has an advisory committee composed of faculty members from a range of disciplines pertinent to the field, specialization and research topic. Each committee consists of at least three members. Committees are broadly based with at least two major disciplines represented by its members. The advisor and the advisory committee provide guidance to allow for the student's intellectual growth in the program.

The advisory committee assesses and approves the thesis-research proposal which is to be prepared by the student by the end of the second year, concurrent with preparation for the qualifying examination.

#### Course Requirements

The minimum course and credit requirements for the PhD in rural studies consist of a common 2.0-credit core of two integrative 1.0-credit courses (Sustainable Rural Systems, and Integrative Research Methods), a 0.25-credit research seminar, and one elective graduate 0.5-credit course or the RST\*6500 Special Topics course. Additional courses may be required by the student's advisory committee. Make-up courses may be required prior to admission to the PhD program or early in the program. All courses will normally be completed prior to the qualifying examination. All or most of the courses should be taken in the first year of study.

To foster the interdisciplinary nature of the program, some courses are team taught. Attention is also paid to the sequencing of courses to promote interdisciplinarity.

#### Qualifying Examination

The qualifying examination for the PhD program in rural studies assesses the acceptability of the intellectual capability and research potential of students. The examination committee is constituted to represent a range of disciplines pertinent to the field.

The qualifying examination is used to determine if the student has an advanced level of knowledge and competence in the area(s) of specialization related to their research. The areas of specialization typically focus on one of the program fields, however, it is acceptable to have an area of specialization outside of these fields as long as it is agreed upon by the graduate student, Program Coordinator, and the Advisory Committee. The qualifying examination has both written and oral components. The written component is based on the common core subject area of the field and the student's selected sector. The oral examination is devoted to discussion of the written materials. The examination evaluates the student's ability to integrate disciplinary knowledge within the field and to undertake interdisciplinary research. The qualifying examination must be completed by the end of semester five.

### Courses

#### Common Core Courses

##### RST\*6000 Sustainable Rural Systems F-W [1.00]

Sustainable development theory in the rural communities and environment context.

Department(s): School of Environmental Design and Rural Development

**RST\*6100 Integrative Research Methods F-W [1.00]**

Research design and evaluation with a focus on measures of sustainability and on interdisciplinary applications.

*Department(s):* School of Environmental Design and Rural Development

**RST\*6300 Research Seminar U [0.25]**

*Department(s):* School of Environmental Design and Rural Development

**Sector Core Courses****RST\*6500 Special Topics U [0.50]**

*Department(s):* School of Environmental Design and Rural Development

## Sociology

The Department of Sociology and Anthropology offers programs of study leading to the degrees of MA and PhD in Sociology in the following fields:

- **Global Agro-Food Systems, Communities and Rural Change (MA, PhD)** This field reflects recent sociological interests in food studies and global agro-food systems, resources and the environment, community sustainability, rural-urban linkages, the transnationalization of labour regimes and social movements in the rural context. Students specializing in this field will be encouraged to take a comparative and historical approach, focusing on cross-national and inter-regional studies where possible, and to examine how class, gender, race and ethnicity play out in each particular substantive topic comprising the rural field.
- **Work, Gender and Change in a Global Context (MA, PhD)** This field reflects recent sociological interests in changing patterns of work and employment in comparative contexts, labour regimes, industrial and organizational change, organizations and protest, education for work and the regulation of work. These trends are located in the broader processes of globalization, economic restructuring and fundamental shifts in public policy. Students specializing in this field will be encouraged to focus on the dialectical relationship between the configurations of gender, class, race and ethnicity, and the transformation of work.
- **Criminology and Criminal Justice (MA)** This field covers sociology of policing, corrections and penology, violent crime, sociology of law, governance and control, crime prevention, risk, criminological theory, critical criminology, street youth, young offenders, gender and offending, and criminal justice theory.
- **Sociological Criminology (PhD)** The field reflects recent sociological interests in homelessness and marginalized peoples, violence against women, homicide, wrongful convictions, crime prevention through environmental design, policing, harm reduction and substance use/abuse, violent offending and victimization, and young offenders.
- **Diversity and Social Inequality (MA, PhD)** This field reflects recent sociological interests in the study of intergroup relations, with special emphasis on struggles over influence and power. Students specializing in this field will acquire a deeper understanding of the complex intersection as well as the overlap of forms of identity and group mobilization based on ethnic, linguistic, regional, class, gender, racial and other forms of social division. The field also provides students with the opportunity to study native issues and policies related to multiculturalism, equity and local or regional autonomy.

See the Department website at <http://www.sociology.uoguelph.ca/> for additional information.

### Administrative Staff

#### Chair

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#### Graduate Program Coordinator

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### Graduate Faculty

#### Ryan Broll

BA, MA, PhD Western - Assistant Professor

#### Myrna Dawson

BA York, MA, PhD Toronto - Professor and Canada Research Chair

#### Elizabeth Finnis

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#### Karine Gagne

BA Concordia, MSc, PhD Montreal - Assistant Professor

#### Andrew Hathaway

BA, MA Calgary, PhD McMaster - Associate Professor

#### Edward J. Hedican

BA Lakehead, MA McMaster, PhD McGill - Professor

#### Mervyn Horgan

BA, MA National University of Ireland, PhD York - Assistant Professor

#### Sally Humphries

BA, MA, PhD York - Associate Professor

#### Linda Hunter

BA, MA Guelph, PhD York - Assistant Professor

#### Satsuki Kawano

BA Keio, MA Minnesota, PhD Pittsburgh - Professor

#### Lisa Kowalchuk

BA McMaster, MA McGill, PhD York - Associate Professor

#### Belinda Leach

BA Carleton, MA, PhD Toronto - Professor

#### Madonna R. Maidment

BA, MA Memorial, PhD Carleton - Associate Professor

#### Thomas (Tad) McIlwraith

BA Toronto, MA UBC, PhD University of New Mexico - Assistant Professor

#### Mavis Morton

BA Carleton, MA, PhD York - Associate Professor

#### William O'Grady

BA, MA Carleton, PhD Toronto - Professor

#### Patrick Parnaby

BA, MA Queen's, PhD McMaster - Associate Professor

#### Vivian Shalla

BA Laurentian, MSc Montreal, PhD Carleton - Associate Professor

#### Sharada Srinivasan

MA, Tata Institute of Social Sciences, MA, PhD Erasmus Univ. Rotterdam, - Assistant Professor, Canada Research Chair in Gender, Justice and Development

#### Ron Stansfield

BSc McMaster, BA, MA Toronto, PhD York - Associate Professor

#### Renée Sylvain

BA Wilfrid Laurier, MA, PhD Toronto - Associate Professor

#### Jeji Varghese

BSc, MA, PhD Alberta - Associate Professor

#### David Walters

BA, MA Western, PhD McMaster - Associate Professor

#### Anthony R. Winson

BA Western, MA, PhD Toronto - Professor

#### Carolyn Yule

BA UBC, MA, PhD Toronto - Assistant Professor

### MA Program

The MA program permits students to become actively involved in research, teaching and professional practice. The objective of the program is to offer opportunities for advanced studies and research in Sociology and is offered in the following fields: 1) global agro-food systems, communities and rural change; 2) work, gender and change in a global context; 3) criminology and criminal justice; and 4) diversity and social inequality.

### Application Procedure

Graduate students are admitted each Fall semester (approximately 10 - 15 students). Students are admitted into the program in the Fall semester only. The program is offered on a full-time basis only. The on-line application and application information can be found at <http://www.uoguelph.ca/graduatestudies/apply> Program offices should be consulted for admission deadlines.

### Admission Requirements

Applicants must possess an Honours BA (4 years) degree or its equivalent with at least a B+ average in the final two years of undergraduate studies. Students who do not meet departmental requirements, e.g., students whose undergraduate degree does not include basic courses in Sociology, may be admitted provisionally and required to complete appropriate make-up courses from offerings in the undergraduate program.

### Degree Requirements

Students enrol in one of two study options: 1) course work and major paper option, or 2) thesis option. Students begin their studies in the Fall semester.

### Course work and Major Research Paper

Students must complete a minimum of 4.0 credits (including 1.0 credit in SOC\*6660) and write a major paper. All students are required to master basic theory and methodological skills. This is fulfilled through the successful completion of the courses SOC\*6140 and SOC\*6070 in the Fall semester and SOC\*6130 in the Winter semester.

All students are required to pass SOC\*6700, Pro-Seminar. This is a two semester course (Fall and Winter) and is graded as SAT/UNSAT. This course is intended to introduce students to the department, the university, and the profession of Sociology.

### Thesis

Students must complete a minimum of 2.0 credits and write a thesis. All students are required to master basic theory and methodological skills. This is fulfilled through the successful completion of the courses SOC\*6140 and SOC\*6070 in the Fall semester and SOC\*6130 in the Winter semester.

All students are required to pass SOC\*6700, Pro-Seminar. This is a two semester course (Fall and Winter) and is graded as SAT/UNSAT. This course is intended to introduce students to the department, the university, and the profession of Sociology.

### PhD Program

The doctoral program comprises three fields within the discipline of Sociology that build on current faculty strengths. These fields are: 1) global agro-food systems, communities and rural change; 2) work, gender and change in a global context; 3) sociological criminology; and 4) diversity and social inequality.

## Degree Requirements

All students in the PhD program are required to successfully complete four courses during the first two semesters of study. Students must also successfully complete two qualifying examinations and a research proposal, and produce and orally defend a dissertation on a topic that has been approved by the advisory committee.

## Admission Requirements

Normally, only applicants with a recognized MA degree in Sociology and with high academic standing (80% or higher) in their graduate-level studies will be admitted into the program.

Students are expected to have successfully completed Master's-level courses in sociological theory as well as Master's-level qualitative and quantitative methodology courses in Sociology. It is also expected that students will have taken courses across the breadth of Sociology.

## Admission Procedure

Graduate students are admitted into the program in the Fall semester only. The program is offered on a full-time basis only. Program offices should be consulted for admission deadlines. The on-line application and application information can be found at <http://www.uoguelph.ca/graduatestudies/apply>

## Collaborative Specializations

### International Development Studies

The Department of Sociology and Anthropology participates in the MA and PhD collaborative specialization in International Development Studies (IDS). Please consult the International Development Studies listing <http://www.uoguelph.ca/cids/> for a detailed description of the MA and PhD collaborative specialization and the special additional requirements for each of the participating departments.

## Courses

### General

#### SOC\*6070 Sociological Theory F [0.50]

Classical and contemporary theoretical perspectives and their inter-relationships. A central concern will be to develop the student's ability to assess theory critically and to understand how theory and research relate to each other.

*Department(s):* Department of Sociology and Anthropology

#### SOC\*6140 Qualitative Research Methods F [0.50]

An examination of the methods of qualitative research, including participant observation and unstructured interviews, as well as the ethical considerations of fieldwork. Other topics, such as comparative and historical methods, may be included.

*Department(s):* Department of Sociology and Anthropology

#### SOC\*6130 Quantitative Research Methods W [0.50]

The application of multiple regression to data generated by non-experimental research, e.g., survey data and data from other sources (census, archival). In large part a course in theory construction, a thorough grounding in the mechanics and statistical assumptions of multiple regression is followed by its application to the construction of structural equation (or causal) models representing substantive theories in sociology and related disciplines.

*Department(s):* Department of Sociology and Anthropology

#### SOC\*6700 Pro-seminar F-W [0.00]

The pro-seminar concerns matters involved in graduate studies and later work as a professional sociologist, including how to form a graduate advisory committee, assistantship responsibilities, presentation skills, exploration of careers in sociology, writing grant proposals, reports and articles, and teaching.

*Restriction(s):* Students in the MA program in Sociology only

*Department(s):* Department of Sociology and Anthropology

#### SOC\*6800 Advanced Topics in Sociological Theory F [0.50]

This course focuses on close readings of, and critical engagement with, select classical and contemporary sociological theories. Students will develop advanced understandings of the philosophical underpinnings of different theoretical approaches and of the ontological and epistemological assumptions of sociological inquiry more generally.

*Prerequisite(s):* MA in Sociology

*Restriction(s):* Students in the PhD program in Sociology only

*Department(s):* Department of Sociology and Anthropology

## Global Agro-Food Systems, Communities and Rural Change

### SOC\*6420 Global Agro-Food Systems, Communities and Rural Change U [0.50]

This course will reflect recent sociological interests in food studies and global agro-food systems, resources and the environment, community sustainability, rural-urban linkages, the transnationalization of labour regimes, and social movements in the rural context. The course will encourage students to take a comparative and historical approach, focusing on cross-national and inter-regional studies where possible, and to examine how class, gender, race and ethnicity play out in each particular substantive topic comprising the rural field.

*Department(s):* Department of Sociology and Anthropology

## Work, Gender and Change in a Global Context

### SOC\*6480 Work, Gender and Change in a Global Context U [0.50]

This course will consider some of the theoretical frameworks available for examining work, workers and work places in the context of globalization, economic restructuring, and shifts in public policy. Using case studies of particular work worlds, the course may include topics such as changing patterns of work and employment in comparative contexts, labour regimes, industrial and organizational change, organizations and protest, education for work, and the regulation of work. The course will focus on the dialectical relationship between the configurations of gender, class, race and ethnicity and the transformation of work.

*Department(s):* Department of Sociology and Anthropology

## Criminology and Criminal Justice/Sociological Criminology

### SOC\*6350 Society, Crime and Control U [0.50]

This seminar course surveys classical theoretical perspectives and more recent theoretical developments in the sociology of crime. It will examine the assumptions and logical structure of each perspective and justifications of particular criminal justice/public policy responses. The course will also critically assess recent empirical research relevant to each perspective.

*Department(s):* Department of Sociology and Anthropology

## Diversity and Social Inequality

### SOC\*6270 Diversity and Social Equality U [0.50]

This course will examine a range of approaches used in the study of intergroup relations, with special emphasis on struggles over influence and power. Students will acquire a deeper understanding of the complex intersection, as well as the overlap among forms of identity and group mobilization based on ethnic, linguistic, regional, class, gender, racial and other forms of social division. The course may also cover native issues and policies related to multiculturalism, equity and local or regional autonomy.

*Department(s):* Department of Sociology and Anthropology

## Other

### SOC\*6400 Special Topics in Sociology U [0.50]

Special topics in sociology will critically examine and evaluate contemporary issues/debates in sociology by looking at contemporary research and the associated theoretical and methodological frameworks/perspectives. Course content is unique in each offering.

*Department(s):* Department of Sociology and Anthropology

### SOC\*6460 Gender and Development F [0.50]

Cross-cultural and historical changes in gender relations and the roles/positions of women brought about by industrialization and the development of the world system. Critical examination of the predominant theories of gender relations, in so far as these inform development research and action in societies with different socio-economic systems. Introduction to the latest theories and research in the area of women and development, as well as with social and political actions undertaken by women themselves. This is one of the two alternative core courses for the collaborative International Development Studies program.

*Department(s):* Department of Sociology and Anthropology

### SOC\*6520 Social Movements and Collective Action F [0.50]

Students will critically review the major theoretical perspectives on social movements and collective action, and consider their relevance in understanding the emergence, tactics, composition and impact of movements in a variety of national contexts. The specific movements to be examined via empirical scholarship will vary each year, but readings will represent several main kinds of collective demands ranging from the redress of oppression of particular groups, to struggles to sustain and enhance societal and human welfare..

*Restriction(s):* Must be enrolled in a graduate program

*Department(s):* Department of Sociology and Anthropology

### SOC\*6550 Selected Topics in Theory and Research U [0.50]

This course will be offered with varying content focusing on theory or research.

*Department(s):* Department of Sociology and Anthropology

**SOC\*6600 Reading Course U [0.50]**

A program of directed reading, complemented with the writing of papers or participation in research. Reading courses are arranged by students through their advisors or advisory committees and must be approved by the chair of the department. This course may be repeated provided different content is involved.

*Department(s):* Department of Sociology and Anthropology

**SOC\*6660 Major Paper U [1.00]**

The major paper is an extensive research paper for those who do not elect to complete a thesis. It may be taken over two semesters.

*Department(s):* Department of Sociology and Anthropology

**SOC\*6810 Reading Course U [0.50]**

A program of supervised independent reading, complemented with the writing of papers or participation in research. Reading courses are arranged by students in consultation with their advisor or advisory committee and must be approved by the chair of the department.

*Restriction(s):* Students in the PhD program in Sociology only

*Department(s):* Department of Sociology and Anthropology

**SOC\*6820 Directed Readings U [0.50]**

A program of directed readings related to the student's field of specialization. The nature and content of the course are agreed upon by the student and instructor in consultation with the student's advisor or advisory committee. The course must be approved by the chair of the department.

*Restriction(s):* Students in the PhD program in Sociology only

*Department(s):* Department of Sociology and Anthropology

## Studio Art

The Master of Fine Arts (MFA) Program in Studio Art prepares students for careers as professional contemporary artists and art educators. The program equally supports interdisciplinary and media-specific practices. It promotes risk-taking, commitment, and critical insight as integral components of an integrated art practice. Studio visits, visiting speakers, and lively group seminars in contemporary art theory and pedagogy augment the individual development of artwork. Faculty advisors work closely with students in directing individual artwork and research projects. Students are also provided with opportunities to connect with the broader arts community. As a culminating highlight, each semester concludes with intensive formal critiques involving all graduate faculty members and fellow students, as well as specially invited critically acclaimed artists and art professionals.

### Administrative Staff

#### Director

Sally Hickson (203 Zavitz Hall, Ext. 56930)  
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#### Graduate Program Coordinator

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### Graduate Faculty

#### Diane Borsato

BFA York, MFA Concordia - Associate Professor

#### James Carl

BFA Victoria, BA McGill, MFA Rutgers - Associate Professor

#### Susan Dobson

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#### Robert Enright

BA Saskatchewan - Professor

#### Christian Giroux

BFA Victoria, MFA Nova Scotia College of Art and Design - Associate Professor

#### John D. Kissick

BFA Queen's, MFA Cornell, MDP Harvard Graduate School of Education - Professor

#### Kim Kozzi (FASTWÜRMS)

AOCA Ontario College of Art - Associate Professor

#### Nestor Kruger

AOCA Ontario College of Art - Assistant Professor

#### Martin Pearce

BFA, MFA Royal College of Art England - Associate Professor

#### Sandra Rechico

BEd Alberta - Associate Professor

#### Dai Skuse (FASTWÜRMS)

BFA Queen's - Associate Professor

#### Monica Tap

BFA, MFA Nova Scotia College of Art and Design - Professor

### Additional Faculty in the School of Fine Art and Music

#### Amanda Boetzkes

BA Victoria, MA, PhD McGill - Assistant Professor

#### Susan Douglas

BA Western, MA Carleton, PhD Concordia - Assistant Professor

#### James Harley

BMus Western Washington, DMus McGill - Associate Professor

#### Sally A. Hickson

BA Carleton, MA, PhD Queen's - Associate Professor

#### Dominic Marner

BA Regina, MA Victoria, PhD East Anglia, Norwich UK - Associate Professor

#### Christina Smylitopoulos

BA Victoria, MA University of York, PhD McGill - Assistant Professor

### MFA Program

The Master of Fine Arts Program in Studio Art equally supports interdisciplinary and media specific practices, such as drawing, painting, printmaking, photography, video, performance, sculpture, and alternative practices. Although studio practice is emphasized, the program also includes courses in art theory, criticism, history and pedagogy. A thesis exhibition is also required. The objective of the program is to prepare students as professional artists and art educators.

The MFA program is intended to produce a high level of professional competence and personal originality in the informed practice of a studio discipline. In response to the numerous and divergent approaches to the making of visual art, the MFA program provides an individually oriented education that is primarily concerned with the development of independent studio work while encouraging a critical awareness of the cultural context and its ideological complexities.

In addition to intense involvement with studio practice, students will be required to demonstrate pertinent knowledge and judgement about the visual arts in presentations, discussions, and written papers within the required course work.

### Admission Requirements

Admission to the MFA program in studio art may be granted on the recommendation of the School of Fine Art and Music to the following applicants:

1. Holders of a BFA degree (honours equivalent), or an Honours BA (or its equivalent in fine art or visual arts); or
2. In exceptional cases, holders of a degree in another field who have completed a minimum of six one-semester courses in fine art or visual arts; or
3. Students who have satisfied the requirements for transfer from the provisional-student category.

**Specific Application Materials for Admission. Each applicant must submit the following:**

1. Documentation of artwork: 20 digital images or up to a 10 minutes DVD or a combination of the two. (For detailed submission information please see the 'How to Apply' section of the School of Fine Art and Music [website at .](#))
2. A single-page statement that outlines the applicant's interest in art, as well as career objectives and reasons for wishing to study in the University of Guelph's MFA program in studio art.
3. Two letters of reference should be written by studio professors who know you and your work well. An acceptable alternative to one such letter may be from the department chair on behalf of the department in which you have studied, or from a professional in the field of contemporary art who is familiar with your abilities.
4. A current curriculum vitae, including education, exhibitions, grants, residencies, and involvement in the art community, including volunteer work.

It is highly recommended that applicants complete at least eight semesters of courses in art history, cultural studies, or related areas prior to applying. Serious interest in, and substantial familiarity with contemporary issues in the visual arts is expected.

### Degree Requirements

The MFA degree at the University of Guelph requires a professional level of studio practice, and a sophisticated awareness of contemporary discourse in visual arts, as well as detailed knowledge of the selected field of specialization. Each degree candidate will complete a thesis. The MFA thesis consists of a solo exhibition, a brief supporting paper, and an oral examination.

The following are some of the specific degree requirements for the MFA degree in studio art (see the Degree Regulations section of this calendar for complete degree regulations):

#### Minimum Duration

The minimum duration is at least four semesters of full-time study.

#### Prescribed Studies

A total of 10.0 credits is required for the completion of this program. In addition to individually oriented studio courses, students are required to complete four MFA seminars; two graduate courses in art theory and criticism courses; and two teaching practicum courses.

A maximum of two courses outside the School of Fine Art and Music may be substituted for courses in art history, theory and criticism. The courses selected must be acceptable to the school and the Assistant Vice-President (Graduate Studies) for graduate credit. All 12 "substantive" courses comprise the candidate's prescribed studies, in which the student must obtain an overall average grade of 'B-' or higher.

#### Additional Courses

In addition to the prescribed studies, the student may undertake to achieve satisfactory standings in ancillary courses supportive of the special discipline. These may be undergraduate or graduate level courses.

#### Exhibition/Paper

Each degree candidate must present an exhibition or performance of their studio work, as well as a critical paper between 4,000 and 5,000 words in length that articulates the aesthetic, historical, theoretical, and technical issues pertinent to their artwork. The submitted studio work must demonstrate a professional level of competence and a significant aesthetic investigation, as approved by the candidate's master's examination committee.

#### The Master's Examination

At the time of the exhibition, the MFA candidate will be expected to successfully complete a final oral examination devoted chiefly to the MFA exhibition with reference to the supporting critical paper. This is a school examination identified as the master's examination.

## School Regulations

In addition to meeting the university's MFA regulations regarding thesis format, the candidate must submit appropriate visual documentation of the MFA exhibition as well as the supporting critical paper, to the director of the School of Fine Art and Music for inclusion in the school's archives.

## Courses

<b>FINA*6510 Introduction to Graduate Studio F [1.50]</b>
A qualifying open-studio course to determine the student's interests and level of performance. The student will come in contact with a variety of faculty and may choose to work in a number of areas during this period. <i>Department(s):</i> School of Fine Art and Music
<b>FINA*6515 MFA Studio I W [1.50]</b>
Sustained work at an independent level under the supervision of the chair of the student's advisory committee. <i>Prerequisite(s):</i> FINA*6510 <i>Department(s):</i> School of Fine Art and Music
<b>FINA*6530 MFA Teaching Practicum I F [0.50]</b>
This course will give the MFA student supervised teaching experience in a studio discipline. In addition, a seminar component will consider theoretical and practical issues relevant to the teaching of studio art. Prerequisite: admission to the MFA program. <i>Department(s):</i> School of Fine Art and Music
<b>FINA*6531 MFA Teaching Practicum II F [0.50]</b>
Continuation of teaching practicum under the guidance of a faculty member. The practicum seminar will consider theoretical and practical issues relevant to the teaching of studio art such as educational goals, course and curriculum planning, academic evaluation, health and safety policies, and appropriate materials and equipment. <i>Prerequisite(s):</i> FINA*6530 <i>Department(s):</i> School of Fine Art and Music
<b>FINA*6540 MFA Seminar I F [0.50]</b>
Examination of critical issues in the visual arts relevant to studio practice <i>Department(s):</i> School of Fine Art and Music
<b>FINA*6545 MFA Seminar II W [0.50]</b>
Continuation of issues examined in FINA*6540 <i>Prerequisite(s):</i> FINA*6540 <i>Department(s):</i> School of Fine Art and Music
<b>FINA*6551 Seminar in Art Theory and Criticism I W [0.50]</b>
Selected topics in art theory and criticism with particular relevance to studio practice. <i>Prerequisite(s):</i> Admission to MFA program or permission of instructor. <i>Department(s):</i> School of Fine Art and Music
<b>FINA*6610 MFA Studio II F [1.50]</b>
Continuation of FINA*6515 <i>Prerequisite(s):</i> FINA*6515 <i>Department(s):</i> School of Fine Art and Music
<b>FINA*6615 MFA Studio III W [1.50]</b>
Continuation of FINA*6610 <i>Prerequisite(s):</i> FINA*6610 <i>Department(s):</i> School of Fine Art and Music
<b>FINA*6640 MFA Seminar III F [0.50]</b>
Continuation of FINA*6545 <i>Prerequisite(s):</i> FINA*6545 <i>Department(s):</i> School of Fine Art and Music
<b>FINA*6641 MFA Seminar IV W [0.50]</b>
Continuation of FINA*6640 <i>Department(s):</i> School of Fine Art and Music
<b>FINA*6652 Individual Study in Art Theory and Criticism W [0.50]</b>
Students will pursue special study under the guidance of a faculty member with appropriate expertise. <i>Prerequisite(s):</i> Approval of the co-ordinator of the MFA program. <i>Department(s):</i> School of Fine Art and Music

## Additional and Elective Courses

<b>FINA*6550 Selected Topics in Fine Art U [0.50]</b>
Seminar in a fine art topic in a subject to be specified by the instructor. <i>Prerequisite(s):</i> Admission to the MFA program. <i>Department(s):</i> School of Fine Art and Music

<b>FINA*6552 Seminar in Canadian Art U [0.50]</b>
Selected topics in Canadian Art <i>Prerequisite(s):</i> Admission to the MFA program and permission of instructor. <i>Department(s):</i> School of Fine Art and Music
<b>FINA*6554 Seminar in Nineteenth Century Art U [0.50]</b>
Selected topics of the period. <i>Prerequisite(s):</i> Admission to the MFA program and permission of instructor. <i>Department(s):</i> School of Fine Art and Music
<b>FINA*6555 Seminar in Twentieth Century Art U [0.50]</b>
Selected topics of the period. <i>Prerequisite(s):</i> Admission to MFA program and permission of instructor. <i>Department(s):</i> School of Fine Art and Music
<b>FINA*6650 Individual Study in Art History U [0.50]</b>
Students will pursue special study under the guidance of a faculty member with appropriate expertise <i>Prerequisite(s):</i> Approval of the co-ordinator of the MFA program. <i>Department(s):</i> School of Fine Art and Music
<b>FINA*6651 Individual Study in Contemporary Art U [0.50]</b>
Students will pursue special study under the guidance of a faculty member with appropriate expertise <i>Prerequisite(s):</i> Approval of the co-ordinator of the MFA program. <i>Department(s):</i> School of Fine Art and Music

## Theatre Studies

### Administrative Staff

#### Director

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### Graduate Faculty

#### Elaine Chang

BA British Columbia, MA, PhD Stanford - Associate Professor

#### Alan Filewod

BA York, MA Alberta, PhD Toronto - Professor

#### Daniel Fischlin

BFA, MA Concordia, PhD York - Professor and University Research Chair

#### Patricia Flood

BFA Alberta - Associate Professor

#### Mark Fortier

BA Windsor, MA Toronto, PhD York, LLB Toronto - Professor

#### Sky Gilbert

BFA York, MA, PhD Toronto - Associate Professor

#### Mark Lipton

BA Concordia, MA, PhD New York - Associate Professor

#### Kimberley McLeod

BA Queen's, MA Alberta, PhD York - Assistant Professor

#### Daniel O'Quinn

BSc, MA Western, PhD York - Professor

#### Paul W. Salmon

BA Western, MA Toronto, PhD Western - Assistant Professor

#### Judith Thompson

BA, Queen's, Cert. National Theatre School - Professor

#### Ann Wilson

BA, MA, PhD York - Associate Professor and Director

### MA Program

The Masters of Arts Degree in Theatre Studies is a research-based degree that offers students the opportunity of working with award winning theatre scholars and practitioners. The program applies several dynamic approaches to theatre studies that merge theory and practice. Students take five courses, including two mandatory courses and three elective courses. The required courses include i) THST\*6220, which provides a context for the discipline and establishes a consistent discourse for students working in the program; and ii) THST\*6150, which introduces students to the theory and practice of theatre-historical analysis, and situates selected aspects of theatre history as a practice and an institution. The degree provides opportunities for students to pursue in depth an area of specialized research.

Elective courses are subject to the special interests of faculty research and practice; these courses will rotate regularly among core faculty. For their electives students may take any graduate course offered in English or Theatre Studies, or may apply to take graduate courses in other programs, however, it is strongly recommended that at least two of the three electives come from the Theatre Studies course offerings in the Winter Semester.

### Admission Requirements

In addition to the minimum requirements stated elsewhere in the Graduate Calendar, applicants to the MA Program in Theatre Studies would normally be expected to have a baccalaureate degree in an honours program (or equivalent) in drama or literature from a recognized post-secondary institution with at least a 78% or higher in the last two years of study. Students with degrees with excellent academic records in other related disciplines will also be considered. In very exceptional circumstances, an applicant may lack the required Honours degree but may be assessed as qualified to undertake the MA program in Theatre Studies on the basis of other experience and practice. For details, contact the Graduate Program Coordinator.

Applicants are not required to write the Graduate Record Examination. Successful applicants will be admitted in the Fall Semester, the Program's only entry point. Program offices should be consulted for admission deadlines.

Applicants whose first language is not English are required to submit documentation of English language proficiency at the time of application.

### Degree Requirements

Students enrol in one of two study options: 1) course work and major paper, or 2) thesis.

### Course Work and Major Paper (MRP)

Students must complete the required: THST\*6220 and THST\*6150 in the student's first semester, plus three Theatre Studies elective courses, plus either THST\*6500 (approx. 7,500 words) or THST\*6280. It is strongly recommended that at least two of the three electives come from Theatre Studies courses offered in the Winter Semester.

### Thesis

Students must complete the required: THST\*6220 and THST\*6150 in the student's first semester, plus one Theatre Studies elective course plus an original research-based thesis (approx. 20,000 to 25,000 words)

Both the thesis and the research paper may, with approval, and contingent upon faculty availability, be completed as exercises in creative writing accompanied by critical and theoretical commentary.

### Internship Opportunities

All students may apply to the Graduate Program Committee to include an internship as part of their program as a course, or as a component of the Major Research Paper or thesis. Internships are not guaranteed, and it is the responsibility of students to make arrangements with their hosts and submit a thorough application including a clear statement of how the internship articulates and supports their program of research.

### Library Resources

The University of Guelph's library resources are remarkable for all aspects of the study of drama and theatre, and particularly for archival and special collections in Canadian Theatre, theatre and performance history, theatre festivals, and individual authors. Applicants who wish to work with these collections are especially welcome.

### Courses

THST*6150 Theatre Historiography F [0.50]
This variable content course introduces students to the theory and practice of theatre historical analysis. The course is required of all students in the Theatre Studies MA Program.
<i>Department(s):</i> School of English and Theatre Studies
THST*6210 Devising W [0.50]
This variable-content course addresses creative practice in the theatre as a site for the production of knowledge. It examines the theoretical and social issues of contemporary theatre practice.
<i>Department(s):</i> School of English and Theatre Studies
THST*6220 Theatre Theory F [0.50]
This variable content course introduces students to a range of theoretical approaches and to advanced issues and methods within the fields of drama, theatre, and performance studies. The course is required for all students in the Theatre Studies MA Program.
<i>Department(s):</i> School of English and Theatre Studies
THST*6230 Performance and Difference W [0.50]
This variable-content course introduces students to the most recent theoretical and critical international developments in the field of Theatre Studies and investigates sites of cultural diversity and difference. It provides opportunities for culturally specific studies of dramatic literature and performance.
<i>Department(s):</i> School of English and Theatre Studies
THST*6250 Bodies and Space in Performance W [0.50]
This variable-content course introduces students to the social, ethical, phenomenological and environmental dimensions of the interaction of bodies and space in theatre practice and research. It provides a theorized context in which students may address questions of acting, directing, and design as research processes.
<i>Department(s):</i> School of English and Theatre Studies
THST*6280 Independent Reading Course U [1.00]
Independent Reading Course
<i>Department(s):</i> School of English and Theatre Studies
THST*6500 Research Paper U [1.00]
<i>Department(s):</i> School of English and Theatre Studies
THST*6801 Reading Course I U [0.50]
An independent study course, the nature and content of which is agreed upon between the individual and the person offering the course. Subject to the approval of the student's advisory committee and the graduate program committee.
<i>Department(s):</i> School of English and Theatre Studies
THST*6802 Reading Course II U [0.50]
An independent study course, the nature and content of which is agreed upon between the individual and the person offering the course. Subject to the approval of the student's advisory committee and the graduate program committee.
<i>Department(s):</i> School of English and Theatre Studies

## Tourism and Hospitality

The School of Hospitality, Food and Tourism Management offers programs of study leading to the MSc degree and Graduate Diploma. Graduates will appreciate how their practical knowledge, competencies and analytical skills can be applied through research to the identification of optimal solutions and justifiable recommendations for employers, customers or researchers.

### Administrative Staff

#### Director

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#### Graduate Program Coordinator

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#### Graduate Program Assistant

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### Graduate Faculty

#### Joachim E. Barth

BSc Guelph, MBA Wilfrid Laurier, MPS Cornell, PhD Cornell - Associate Professor

#### HS Chris Choi

BA Chung-Ang, MTA George Washington, PhD Texas A&M - Professor and Graduate Program Coordinator

#### Statia Elliot

BCom St. Mary's, MA McMaster, PhD Carleton - Associate Professor and Director

#### Kerry Godfrey

BSc Victoria, MSc Surrey, PhD Oxford Brooke - Professor

#### Mark Holmes

BComm, MSA Ryerson, PhD York - Assistant Professor

#### WooMi Jo

BS Kansas, MS Houston, PhD Kansas - Associate Professor

#### Marion Joppe

BA Waterloo, MLaw, PhD d'Aix-Marseille III - Professor

#### Tanya MacLaurin

BSc Kansas State, MSc Kansas, PhD Kansas - Professor

#### William Murray

BA Algonquin, MBA Guelph, PhD Saint Mary's - Assistant Professor

#### Erna van Duren

BA Waterloo, MSc, PhD, Guelph - Professor

#### Bruce McAdams

BComm, MA Guelph - Assistant Professor

### MSc Program

The objective of the program is to develop a solid academic background and underpinning in the field of tourism, alongside research, critical reasoning, problem solving and data analysis skills. The intention is to equip students with the necessary skills to identify optimal solutions and justifiable recommendations for employers, customers or other researchers. In so doing, graduates will develop demonstrable competence in the assessment of existing literature, research conceptualization and design, quantitative and qualitative research methods and data analysis techniques. Completion of the program can serve as a foundation for the pursuit of a PhD.

### Admission Requirements

All students entering the MSc are required to hold an undergraduate Honour's degree with a minimum B+ or equivalent, from a recognized post-secondary institution (see also Graduate Diploma in Tourism Research (GDip) for alternate admission requirements). In addition, they should have a GMAT score of 550 or better or a GRE score of 1200 (Minimum verbal score of 450) or better.

Applicants also need to have an academic or industry background in tourism, the social sciences, humanities or professional/business related programs in allied areas such as hospitality, travel, human resources, marketing or consumer studies. For applicants who did not major in these areas in their undergraduate degree or diploma, additional prerequisites may be required.

MSc applicants who believe their experiential learning may compensate for a lack of academic standing and thus not meet the University's minimum requirements may contact the Graduate Program Coordinator regarding alternative admissions criteria, which normally would require at least 5 years in a research or equivalent position in industry.

### Degree Requirements

All students will complete six courses, three core courses and three restricted electives, plus the thesis proposal and defence. The thesis is expected to be sufficiently meritorious to warrant publication in reputable refereed journals within the student's field and area of specialization. The three core courses cover topics dealing with the theories, methods, contemporary issues, and research applications in tourism and hospitality. The three restricted electives include: one quantitative methods course; one qualitative methods course; and one topic course. All are to be chosen in consultation with the School's Graduate Program Coordinator. It is intended that the topic will be related to and/or lead to the student's thesis proposal and subsequent research.

### Core Courses

TRMH*6100	[0.50]	Foundations of Tourism and Hospitality
TRMH*6200	[0.50]	Contemporary Issues in Tourism
TRMH*6310	[0.50]	Research Applications in Tourism and Hospitality
TRMH*6400	[1.00]	Thesis Proposal

### Restricted Electives

One of the following quantitative research methods courses:

TRMH*6290	[0.50]	Research Methods for Tourism and Hospitality
SOC*6130	[0.50]	Quantitative Research Methods
PSYC*6060	[0.50]	Research Design and Statistics

Or with permission

GEOG*6090	[0.50]	Geographical Research Methods I plus
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One of the following qualitative research methods courses:

MCS*6080	[0.50]	Qualitative Research Methods
ANTH*6140	[0.50]	Qualitative Research Methods
SOC*6140	[0.50]	Qualitative Research Methods
FRAN*6020	[0.50]	Qualitative Methods

plus

One of the following topic courses:

HTM*6300	[0.50]	Hospitality and Tourism Marketing
HTM*6600	[0.50]	International Tourism and Tourism Marketing
HTM*6630	[0.50]	Special Topics in Tourism
TRMH*6250	[0.50]	Tourism and Sustainable Development
TRMH*6270	[0.50]	Data Mining Practicum

Or other courses as appropriate depending on availability

Note: Candidates for the MSc who successfully complete at least 2.5 credits of course work, with a minimum 70% overall average grade, and no less than 65% in any single HTM course in the 2.5 credits, may be eligible to receive a Type 1 Graduate Diploma in Tourism Studies, if they choose to withdraw from the program.

### Graduate Diploma Program in Tourism Research

The objective of the Graduate Diploma is to provide highly focused training in tourism research, including theoretical concept assessment, conceptual model development, methodology selection, research design, data analysis, and presentation of results. The intention is to equip students with the necessary skills to identify optimal solutions and justifiable recommendations for employers, customers or other researchers. The diploma program is designed to meet the needs of students who want to extend their knowledge of tourism research beyond the level they obtained while taking their undergraduate degree. It also offers alternate entry criteria and the opportunity to transfer to the MSc, depending on individual academic performance in courses and an application.

### Admission Requirements

Applicants for the GDip in tourism research are required to have completed a four year honours degree with a minimum of B+ average or equivalent, from a recognized post-secondary institution.

All applicants should have a GMAT score of 550 or better or a minimum GRE score of 150 (Verbal) and 159 (Quantitative) (On the previous scale: Minimum 1200 with a minimum verbal score of 450 or better).

Applicants also need to have an academic or industry background in tourism, the social sciences, humanities or professional/business related programs in allied areas such as hospitality, travel, human resources, marketing or consumer studies. For applicants who did not major in these areas in their undergraduate degree or diploma, additional prerequisites may be required.

Any applicant who believes that their experiential learning may compensate for a lack of academic standing and thus not meet the University's minimum requirements may contact the Graduate Program Coordinator regarding alternative admissions criteria, which normally would require at least 5 years in a research or equivalent position in industry.

### Diploma Requirements

All students must complete three core courses and three restricted electives. The three core courses cover topics dealing with the theories, methods, contemporary issues, and research applications in tourism and hospitality. The three restricted electives include: one quantitative methods course; one qualitative methods course; and one topic course. All are to be chosen in consultation with the School's Graduate Program Coordinator.

## Core Courses

TRMH*6100	[0.50]	Foundations of Tourism and Hospitality
TRMH*6200	[0.50]	Contemporary Issues in Tourism
TRMH*6310	[0.50]	Research Applications in Tourism and Hospitality

## Restricted Electives

One of the following quantitative research methods courses:

MCS*6050	[0.50]	Research Methods in Marketing and Consumer Studies
SOC*6130	[0.50]	Quantitative Research Methods
PSYC*6060	[0.50]	Research Design and Statistics
TRMH*6290	[0.50]	Research Methods for Tourism and Hospitality

Or with permission

GEOG*6090	[0.50]	Geographical Research Methods I plus
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One of the following qualitative research methods courses:

MCS*6080	[0.50]	Qualitative Research Methods
ANTH*6140	[0.50]	Qualitative Research Methods
SOC*6140	[0.50]	Qualitative Research Methods

Or with permission

FRAN*6020	[0.50]	Qualitative Methods plus
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One of the following topic courses:

HTM*6300	[0.50]	Hospitality and Tourism Marketing
HTM*6600	[0.50]	International Tourism and Tourism Marketing
TRMH*6250	[0.50]	Tourism and Sustainable Development
TRMH*6270	[0.50]	Data Mining Practicum

Or other courses as appropriate depending on availability

## Transfer to MSc in Tourism and Hospitality

Candidates admitted to the graduate diploma who wish to transfer to the MSc once they have commenced their program of study, must achieve a minimum grade of 75% in the three compulsory courses, and no mark less than 70% across all courses.

## Courses

### TRMH\*6100 Foundations of Tourism and Hospitality F [0.50]

The course is designed to discuss theoretical concepts and theories which provide an understanding of societal, managerial and strategic aspects of tourism and hospitality. An emphasis will also be placed on key theories and concepts of relevant disciplines which may affect tourism and hospitality research.

*Department(s):* School of Hospitality, Food and Tourism Management

### TRMH\*6200 Contemporary Issues in Tourism W [0.50]

The course will acquaint students with the tourism industry. An overview of the scale and scope, involved stakeholders, and the organization of the industry will be examined and critiqued. An emphasis will be placed on the sustainable development and management of tourism resources and organizations.

*Prerequisite(s):* TRMH\*6100

*Department(s):* School of Hospitality, Food and Tourism Management

### TRMH\*6250 Tourism and Sustainable Development F [0.50]

The course introduces students to the issues affecting planning and development of tourism by understanding tourism planning and sustainable development. Core elements include a discussion on tourism impacts (economic, social, cultural and environmental), issues of sustainability, carrying capacity, 'eco-tourism' and other 'alternative forms' of tourism.

*Department(s):* School of Hospitality, Food and Tourism Management

### TRMH\*6270 Data Mining Practicum W [0.50]

An applied course introducing popular concepts, methods and applications of data mining utilizing data warehoused at the government agencies and user friendly software and cases. This course covers various topics in data mining association rule, clustering, logistic regression, decision tree and artificial neural network.

*Prerequisite(s):* TRMH\*6100 and PSYC\*6060

*Co-requisite(s):* Must take one of these courses ANTH\*6140, MCS\*6080 or SOC\*6140

*Department(s):* School of Hospitality, Food and Tourism Management

### TRMH\*6290 Research Methods for Tourism and Hospitality F [0.50]

This course looks at selected analytical techniques in tourism and hospitality research, both empirical and subjective, as well the nature of research questions and theory. The course is intended to help students make informed judgements about selected research tools and designs, and draw logical and substantive conclusions.

*Department(s):* School of Hospitality, Food and Tourism Management

### TRMH\*6310 Research Applications in Tourism and Hospitality W [0.50]

This course is designed to enhance the student's analytical capability, using both basic and advanced analytical techniques and tools of tourism and hospitality research. They learn to critically evaluate, enabling them to make effective judgments, choose proper statistical techniques, and draw logical and substantive conclusions.

*Prerequisite(s):* TRMH\*6100 and one of TRMH\*6290, MCS\*6050, SOC\*6130 or PSYC\*6060

*Co-requisite(s):* Must take one of these courses ANTH\*6140, MCS\*6080, FRAN\*6020 or SOC\*6140

*Department(s):* School of Hospitality, Food and Tourism Management

### TRMH\*6400 Thesis Proposal F,W,S [1.00]

The students engage in seminars to share experiences and reflections on the research process. This course is a development of the proposal: framing a research question, developing a methodological plan within a challenging interdisciplinary area such as tourism and hospitality, data planning and more.

*Prerequisite(s):* TRMH\*6100, TRMH\*6200, TRMH\*6310, one of TRMH\*6290, MCS\*6050, SOC\*6130 or PSYC\*6060 and one of ANTH\*6140, MCS\*6080, FRAN\*6020 or SOC\*6140

*Department(s):* School of Hospitality, Food and Tourism Management

## Veterinary Science

The Doctor of Veterinary Science (DVSc) program involves members of the graduate faculty in the Departments of Biomedical Science, Clinical Studies, Pathobiology and Population Medicine of the Ontario Veterinary College. Admission, progress, and certification for graduation of students enrolled in the DVSc program is administered by the respective departments.

### Administrative Staff

#### Associate Dean, Research and Innovation

Dr. Gordon Kirby (2638C OVC, Ext. 54948)

gkirby@ovc.uoguelph.ca

#### Assistant to Associate Dean, Research and Innovation

Daphne Summers (2653 OVC, Ext. 54406)

dsummers@uoguelph

### DVSc Program

The DVSc is a unique post-professional degree. The DVSc program provides advanced discipline training and research at the doctoral level. It involves course and investigational work on an applied problem, together with advanced discipline training. Students enrolled in the program select one of the sixteen specializations (listed below) and register in the appropriate department. The departments and specializations are:

- Biomedical Sciences
  - Clinical Pharmacology
- Clinical Studies
  - Comparative medicine, small animal medicine, small animal surgery, large animal medicine, large animal surgery, emergency medicine and critical care, anesthesiology, radiology, neurology, oncology and clinical nutrition
- Pathobiology
  - Clinical pathology, anatomic pathology, laboratory-animal science, clinical microbiology, wildlife and zoo animal medicine and pathology, avian and exotic medicine and pathology and fish pathology.
- Population Medicine
  - Clinical epidemiology, ruminant health management, swine health management and theriogenology

### Admission Requirements

The normal basis for admission to DVSc studies is a DVM or equivalent degree that would allow the applicant to be eligible for licence to practice veterinary medicine in Ontario. The applicant must have achieved high academic standing according to the standards of the University of Guelph.

Students who meet the aforementioned requirements and possess either an acceptable graduate diploma, MSc degree, or PhD degree with 'B+' average standing may be admitted and granted credit for two semesters in the DVSc program.

A student enrolled in the graduate diploma program who achieves a superior record and shows a particular aptitude for applied studies may be authorized by the Board of Graduate Studies, on recommendation of the student's advisory committee, to transfer to the DVSc program without completing the graduate diploma program. This authorization must be granted no later than the end of the second semester of study. The transfer will be effective the following semester.

### Degree Requirements

A minimum of 2.50 course credits is required. A qualifying examination must be taken prior to the end of the sixth semester to assess the student's knowledge of the selected area of specialization and the basic sciences supporting this area. Candidates are required to develop investigational skills in their distinctive area of specialization by carrying out an original study, generally related to animal health. The research must make a significant contribution to the area of specialization, be written up as a thesis, and defended.

At least nine semesters of full-time study must be devoted to the DVSc program. Additional information on the DVSc program may be found in the calendar description of each participating department.

## Other Departments

### School of Languages and Literatures

Director:

Daniel Chouinard, 265 MacKinnon, ext. 54891/53883

The School offers the following undergraduate programs:

#### Département D'Études Françaises

Head : Dr. Frédérique Arroyas, 278 MacKinnon, ext. 52885/53884

#### Classics

Head: Dr. Padraig O'Cleirigh, 244 MacKinnon, ext. 53156/53883

#### European Studies

Coordinator: Dr. Dorothy Odartey-Wellington, 276 MacKinnon, ext. 53179/53883

#### German Studies

Head: Dr. Paola Mayer, 255 MacKinnon, ext. 58562/53883

#### Italian Studies

Head: Dr. Mary DeCoste, 284 MacKinnon, ext. 53187/53883

#### Spanish Studies

Head: Dr. Stephen Henighan, 274 MacKinnon, ext. 54489/53884

The School of Languages and Literatures presently offers a program in french for graduate students. Graduate students who are required by their departments to fulfil a language requirement other than french, should consult the Undergraduate Calendar. Classes in German, Greek, Italian, Latin and Spanish are all available. Any graduate student who considers their language ability sufficient to meet departmental requirements may submit to a test, in the first week of the Fall or the Winter semester. Requests should reach the Head of the program involved at least two weeks before the test. In the case of a pass, the School will report to the Assistant Vice-President (Graduate Studies) that the student has successfully passed a reading test in the language, and the student's record is annotated to that effect. Grades are not shown.

Examinations are offered in French, German, Greek, Italian, Latin or Spanish, and others may be considered. Several members of the faculty in the School are members of the graduate faculty of other departments and participate in their graduate programs as follows:

#### Frederique Arroyas

BA, MA, PhD Western Ontario - Associate Professor

#### Daniel Chouinard

BaSp, MA, PhD (Montréal) for SLAPSIE (MA in English/SETS) - Assistant Professor

#### Dawn M. Cornelio

BA, MA, PhD Connecticut - Associate Professor

#### Stephen Henighan

BA (Swarthmore), MA (C'DIA), PhD (Oxford) (MA in English/SETS) - Associate Professor

#### Margot Irvine

BA, MA, PhD Toronto - Assistant Professor

#### Padraig O'Cleirigh

BA, MA National Univ. of Ireland, PhD (Cornell) (MA/PhD in History) - Associate Professor

#### Dana Paramskas

BSL, MSL (Georgetown), PhD (Laval) (MA in English and Drama/SETS) - Professor

#### Joubert Satyre

BA State University Haiti, MEd, PhD Montreal - Associate Professor

#### Alain Thomas

BA York, MA, PhD Toronto - Associate Professor

### Music

Director of the School of Fine Art and Music

John D. Kissick (Zavitz 203, Ext. 56930)

The Music program does not presently offer programs for graduate students.