The information published in this Graduate Calendar outlines the rules, regulations, curricula, programs and fees for the 2019-2020 academic year, including the Summer Semester 2019, Fall Semester 2019 and the Winter Semester 2020.

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:

- Universities of Canada

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Revision Information:

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Disclaimer
The Office of Graduate and Postdoctoral 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
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.
Collection, Use and Disclosure of Personal Information

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. 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 Advanced Education and Skills Development, 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

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

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

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

Students are responsible for maintaining a current mailing address with the University. Address changes can be made, in writing, through Registrarial Services.

Name Changes

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, their complete, legal name. Any requests to change a name, by means of alteration, deletion, substitution or addition, must be accompanied by appropriate supporting documentation.

Student Confidentiality and Release of Student Information Policy Excerpt

The University undertakes to protect the privacy of each student and the confidentiality of their 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 https://www.uoguelph.ca/secretariat/office-services/university-secretariat/university-policies.
Graduate Degree Learning Outcomes

On May 27, 2013, the University of Guelph Senate approved the following five University-wide Learning Outcomes as the basis from which to guide the development of graduate degree programs, specializations and courses:

1. Critical and Creative Thinking
2. Literacy
3. Global Understanding
4. Communication
5. Professional and Ethical Behaviour

These learning outcomes are also intended to serve as a framework through which our educational expectations are clear to students and the broader public; and to inform the process of outcomes assessment through the quality assurance process (regular reviews) of programs and departments.

An on-line guide to the learning outcomes, links to the associated skills, and detailed rubrics designed to support the development and assessment of additional program and discipline-specific outcomes, are available for reference on the Learning Outcomes website.

### Critical and Creative Thinking

Critical and creative thinking is a concept in which one applies logical principles, after much inquiry and analysis, to solve problems with a high degree of innovation, divergent thinking and risk taking. Those mastering this outcome show evidence of integrating knowledge and applying this knowledge across disciplinary boundaries. Depth and breadth of understanding of disciplines is essential to this outcome. At the graduate level, originality in the application of knowledge (master’s) and undertaking of research (doctoral) is expected.

In addition, Critical and Creative Thinking includes, but is not limited to, the following outcomes: Independent Inquiry and Analysis; Problem Solving; Creativity; and Depth and Breadth of Understanding.

### Literacy

Literacy is the ability to extract information from a variety of resources, assess the quality and validity of the material, and use it to discover new knowledge. The comfort in using quantitative literacy also exists in this definition, as does using technology effectively and developing visual literacy.

In addition, Literacy includes, but is not limited to, the following outcomes: Information Literacy, Quantitative Literacy, Technological Literacy, and Visual Literacy.

### Global Understanding

Global understanding encompasses the knowledge of cultural similarities and differences, the context (historical, geographical, political and environmental) from which these arise, and how they are manifest in modern society. Global understanding is exercised as civic engagement, intercultural competence and the ability to understand an academic discipline outside of the domestic context.

In addition, Global Understanding includes, but is not limited to, the following outcomes: Global Understanding, Sense of Historical Development, Civic Knowledge and Engagement, and Intercultural Competence.

### Communication

Communication is the ability to interact effectively with a variety of individuals and groups, and convey information successfully in a variety of formats including oral and written communication. Communication also comprises attentiveness and listening, as well as reading comprehension. It includes the ability to communicate and synthesize information, arguments, and analyses accurately and reliably.

In addition, Communication includes, but is not limited to, the following outcomes: Oral Communication, Written Communication, Reading Comprehension, and Integrative Communication.

### Professional and Ethical Behaviour

Professional and ethical behaviour requires the ability to accomplish the tasks at hand with proficient skills in teamwork and leadership, while remembering ethical reasoning behind all decisions. The ability for organizational and time management skills is essential in bringing together all aspects of managing self and others. Academic integrity is central to mastery in this outcome. At the graduate level, intellectual independence is needed for professional and academic development and engagement.

In addition, Professional and Ethical Behaviour includes, but is not limited to, the following outcomes: Teamwork, Ethical Reasoning, Leadership, Personal Organization and Time Management, and Intellectual Independence.
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January 28, 2020
## 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/School

#### College of Arts
- Art History and Visual Culture
- Creative Writing
- Critical Studies in Improvisation
- 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

#### Gordon S. Lang School of Business and Economics
- Business Administration
  - Food and Agribusiness Management
  - Hospitality and Tourism Management
  - Sustainable Commerce
- Economics
- Leadership
- Management
- Marketing and Consumer Studies
- Tourism and Hospitality

#### College of Engineering and Physical Science
- Chemistry
- Computational Sciences
- Computer Science
- Cybersecurity and Threat Intelligence
- 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
- Social Practice and Transformational Change

#### 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

### Interdepartmental Programs

Interdepartmental programs involve faculty members across departments.
- Bioinformatics
- Biophysics
- Biotechnology
- Food Safety and Quality Assurance
- Social Practice and Transformational Change

### 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
- Critical Studies in Improvisation
- 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
- Cybersecurity and Threat Intelligence
- 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
Social Practice and Transformational Change
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**
James Squires (223 ANNU, Ext. 53928)
jqsquires@uoguelph.ca

**Graduate Program Coordinator**
Niel Karrow (123 ANNU, Ext. 53646)
nkarrow@uoguelph.ca

**Graduate Program Assistant**
Wendy McGrattan (144 ANNU, Ext. 56215)
wmcgratt@uoguelph.ca

**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

**Jennifer Ellis**
BSc, MSc, PhD Guelph - Assistant Professor

**Ming Z. Fan**
BS Xinjiang, MS Harbin, PhD Alberta - Professor

**Alexandra Harlander**
DVM, DVSc Vienna, Ph.D. Germany - Assistant Professor

**Lee-Anne Huber**
BSc, MSc, PhD Guelph - Assistant Professor

**Niel A. Karrow**
BSc Guelph, PhD Guelph - 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

**Michael Steele**
BSc, MSc, PhD Guelph - Assistant Professor

**Dan Tulpan**
BSc Burcharest, PhD British Columbia - Assistant Professor

**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 2 semester courses, however we do not split a semester and we will not consider any fewer than 16 courses.

**Program 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 (7 courses). Of these courses, one will be the 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.

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*6610 [0.50] Topics in Comparative Animal Nutrition
- ANSC*6630 [0.50] Metabolism Modeling Processes
- ANSC*6630 [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
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.

Program 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.

One Health

The Department of Animal Biosciences participates in the collaborative specialization in One Health. Master's and Doctoral students wishing to undertake thesis research or their major research paper/project with an emphasis on one health are eligible to apply to register concurrently in Animal Biosciences and the collaborative specialization. Students should consult the One Health listing for more information.

Toxicology

The Department of Animal Biosciences participates in the masters/doctoral collaborative specialization in toxicology. The research and teaching expertise of these faculty include aspects of toxicology; they may serve as advisors for masters and doctoral 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 masters/doctoral 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

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Credits</th>
<th>Description</th>
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<tbody>
<tr>
<td>ANSC*6210</td>
<td>Principles of Selection in Animal Breeding</td>
<td>[0.50]</td>
<td>Definition of selection goals, prediction of genetic progress and breeding values, and the comparison of selection programs.</td>
</tr>
<tr>
<td>ANSC*6240</td>
<td>Topics in Animal Genetics and Genomics</td>
<td>[0.50]</td>
<td>Current literature and classical papers pertaining to quantitative genetics, animal breeding and animal genomics are reviewed in detail through presentation, discussion and critical analysis.</td>
</tr>
<tr>
<td>ANSC*6370</td>
<td>Quantitative Genetics and Animal Models</td>
<td>[0.50]</td>
<td>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.</td>
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Animal Nutrition

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<th>Course Code</th>
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<tr>
<td>ANSC*6390</td>
<td>QTL and Markers W</td>
<td>[0.50]</td>
<td>Advanced training in QTL mapping and selection assisted by genetic markers.</td>
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Animal Physiology

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<tr>
<th>Course Code</th>
<th>Title</th>
<th>Credits</th>
<th>Description</th>
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<tr>
<td>UNIV*6030</td>
<td>Modelling Metabolic Processes F</td>
<td>[0.50]</td>
<td>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.</td>
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Animal Behaviour and Welfare

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Credits</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>ANSC*6400</td>
<td>Advanced Critical Analysis in Applied Ethology</td>
<td>[0.50]</td>
<td>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.</td>
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<td>Course Code</td>
<td>Course Name</td>
<td>Offerings</td>
<td>Prerequisite(s)</td>
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<tr>
<td>ANSC*6700</td>
<td>Animals in Society: Historical and Global Perspectives on Animal Welfare F</td>
<td>[0.50]</td>
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<td></td>
<td>A seminar course covering society's duties to animals. Students will learn</td>
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<td></td>
<td>about the major ethical theories that deal with society's duties towards</td>
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<td></td>
<td>animals, the main scientific approaches to animal welfare, and the</td>
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<td>relationship of science to ethics. A brief history</td>
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<td>of human-animal relationships will be covered and cultural differences</td>
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<td>described. Students will use this to analyze some current issues.</td>
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<td>Department(s): Department of Animal Biosciences</td>
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<tr>
<td>ANSC*6710</td>
<td>Assessing Animal Welfare in Practice W [0.50]</td>
<td>Winter</td>
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<td></td>
<td>A lecture/seminar course covering the principles of applied animal welfare</td>
<td>offering</td>
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<td></td>
<td>assessment. Students will learn what influences an animal welfare assessment</td>
<td>on-campus,</td>
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<td>and will understand the components necessary to create an effective and</td>
<td>Summer</td>
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<td>targeted animal welfare program for industry or regulatory</td>
<td>offering</td>
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<td></td>
<td>application.</td>
<td>Distance</td>
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<td></td>
<td>Offering(s): Winter offering on-campus, Summer offering Distance Education.</td>
<td>Education.</td>
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<tr>
<td></td>
<td>Prerequisite(s): ANSC*6700</td>
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<td></td>
<td>Department(s): Department of Animal Biosciences</td>
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<tr>
<td>ANSC*6730</td>
<td>Applied Environmental Physiology and Animal Housing W [0.50]</td>
<td>[0.50]</td>
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<td></td>
<td>A lecture/seminar course covering the principles of applied environmental</td>
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<td>physiology including temperature regulation, space requirements, animal</td>
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<td>responses to light and other aspects of the physical environment. Students</td>
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<td>pursue a topic in depth to develop or update recommended codes of practice</td>
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<td>and resource-based standards.</td>
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<td>Department(s): Department of Animal Biosciences</td>
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<tr>
<td>ANSC*6720</td>
<td>Scientific Assessment of Affective States in Animals W [0.50]</td>
<td>[0.50]</td>
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<td></td>
<td>Graduate students will explore the biology and validity of behavioural and</td>
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<td>physiological techniques used in animal welfare assessment such as:</td>
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<td>sympathetic activation, HPA functioning, stereotypic behaviour and</td>
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<td>preference responses. A combination of lecture, instructor-led discussion and</td>
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<td>student-led discussion will explore these methods of animal welfare</td>
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<td>assessment.</td>
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<td>Department(s): Department of Animal Biosciences</td>
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<tr>
<td>ANSC*6740</td>
<td>Special Topics in Applied Animal Welfare Science S [0.50]</td>
<td>[0.50]</td>
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<td></td>
<td>A lecture/seminar course covering in depth topics in applied animal welfare</td>
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<td>science. The course will review the scientific research into the welfare of</td>
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<td>a specific animal species or a specific animal welfare problem common across</td>
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<td>species, focusing on the main threats to welfare, relevant indicators of</td>
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<td>welfare, and possible solutions to improve welfare.</td>
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<td>Department(s): Department of Animal Biosciences</td>
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<tr>
<td>UNIV*6030</td>
<td>Seminars and Analysis in Animal Behaviour and Welfare</td>
<td>[0.50]</td>
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<tr>
<td></td>
<td>General</td>
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<tr>
<td>ANSC*6050</td>
<td>Biometry for Animal Sciences W [0.50]</td>
<td>[0.50]</td>
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<td></td>
<td>For students involved in animal research. The course will provide outlines</td>
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<td>of appropriate presentation and analysis of experimental data with emphasis</td>
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<td>on different analytical techniques.</td>
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<td>Department(s): Department of Animal Biosciences</td>
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<tr>
<td>ANSC*6100</td>
<td>Special Project F,W,S [0.50]</td>
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<td>Supervised program of study in some aspect of animal and poultry science that</td>
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<td>can involve an experimental project and/or detailed analysis of the literature.</td>
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<td>Department(s): Department of Animal Biosciences</td>
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<tr>
<td>ANSC*6330</td>
<td>Topics in Computational Biology and Bioinformatics F,W [0.50]</td>
<td>[0.50]</td>
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<td></td>
<td>Major topics and methods in bioinformatics and computational biology for</td>
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<td>animal sciences will be covered. Topics include alignments, phylogenetics,</td>
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<td>genomics, data mining, databases, DNA, RNA and protein structures, DNA</td>
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<td>sequence analysis, data curation, pipeline construction and data visualization.</td>
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<td>Offering(s): Offered annually</td>
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<td>Department(s): Department of Animal Biosciences</td>
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<td>ANSC*6490</td>
<td>Advanced Dairy Management W [0.50]</td>
<td>[0.50]</td>
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<td>A comprehensive systems science and integrative capstone course that</td>
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<td>encompasses the “closing of the loop” education of dairy production systems.</td>
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<td>Students will be exposed to real-time issues relating to dairy production</td>
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<td>from, environment, economics, nutrition, housing, health, welfare, society</td>
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<td>and agrology. This course will allow the student to practice their training</td>
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<td>from the courses they have been exposed to as undergraduates into many case</td>
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<td>study evaluations on farms provincially, nationally and internationally.</td>
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<td>Restriction(s): Instructor consent required.</td>
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<td>Department(s): Department of Animal Biosciences</td>
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<td>ANSC*6600</td>
<td>Scientific Communication I F,W [0.25]</td>
<td>[0.25]</td>
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<td></td>
<td>This course is required for completion of a thesis-based MSc degree. Via</td>
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<td>reading, guest lectures, online modules and in-class discussion, students</td>
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<td>will learn about the principles of effective communication, and with training</td>
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<td>and feedback create a departmental webpage and oral presentation outlining</td>
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<td>their research plans.</td>
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<td>Restriction(s): Restricted to Animal Biosciences students.</td>
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<td>Department(s): Department of Animal Biosciences</td>
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<tr>
<td>ANSC*6610</td>
<td>Thesis Proposal and Professional Development I F,W [0.25]</td>
<td>[0.25]</td>
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<td></td>
<td>This course is required for successful completion of an MSc thesis degree. Via</td>
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<td>guidance and instruction, students complete a research proposal, or a literature</td>
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<td>review for their thesis. Students will also spend 8 hours on professional</td>
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<td>development (e.g. via mygradskills.ca, MITAC Step workshops).</td>
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<td>Restriction(s): Restricted to Animal Biosciences students.</td>
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<td>Department(s): Department of Animal Biosciences</td>
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<td>ANSC*6620</td>
<td>Scientific Communication II F,W [0.00]</td>
<td>[0.00]</td>
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<td>This course is required for successful completion of a PhD degree. Via reading</td>
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<td>guest lectures, online modules and in-class discussion, students will learn</td>
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<td>about the principles of effective communication, and with training and</td>
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<td>feedback, create a departmental webpage and oral presentation outlining their research plans.</td>
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<td>Prerequisite(s): ANSC*6600</td>
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<td>Restriction(s): Restricted to Animal Biosciences PhD students.</td>
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<td>Department(s): Department of Animal Biosciences</td>
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<tr>
<td>ANSC*6630</td>
<td>Thesis Proposal and Professional Development II F,W [0.00]</td>
<td>[0.00]</td>
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<td></td>
<td>This course is required for successful completion of a PhD degree. Via reading</td>
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<td>guest lectures, online modules and in-class discussion, students will learn</td>
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<td>about the principles of effective communication, and with training and</td>
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<td>feedback, create a departmental webpage and oral presentation outlining their research plans.</td>
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<td>Prerequisite(s): ANSC*6610</td>
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<td>Restriction(s): Restricted to Animal Biosciences PhD students.</td>
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<td>Department(s): Department of Animal Biosciences</td>
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<tr>
<td>ANSC*6900</td>
<td>Major Paper in Animal and Poultry Science F,W,S [1.00]</td>
<td>[1.00]</td>
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<td>A detailed, critical review of an area of study related to the specialized</td>
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<td>of students in the MSc by course work and major paper option that includes</td>
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<td>analysis and interpretation of relevant data.</td>
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<td>Department(s): Department of Animal Biosciences</td>
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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 totality. 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

Martin Pearce
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Susan Douglas
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Barb Merrill
Graduate Program Assistant (Zavitz Hall 201, Ext. 54671) bmerrill@uoguelph.ca

Graduate Faculty

Amanda Boetzes
BA Victoria, MA, PhD McGill - Professor

Susan J. Douglas
BA Western Ontario, MA Carleton, PhD Concordia - Assistant Professor

Sally Hickson
BA Carleton, MA, PhD Queen’s - Associate Professor

Dominic J. Marner
BA Regina, MA Victoria, PhD East Anglia (UK) - Associate Professor

Christina Smyrilotopoulos
BA Victoria, MA University of York, PhD McGill - Associate 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.

Program Requirements

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

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 AHVC Graduate 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.

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, a public colloquium 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

Students must obtain an overall average grade of at least ‘B-’ standing.

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

2019-2020 Graduate Calendar

January 28, 2020
### Elective Courses

**AVC*6310 Topics in Art & Visual Culture I [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 a curator, or other museum or arts professional. This experience may be based in a museum department, gallery, 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

<table>
<thead>
<tr>
<th>Position</th>
<th>Name</th>
<th>Contact Information</th>
</tr>
</thead>
<tbody>
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</tr>
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Graduate Faculty

<table>
<thead>
<tr>
<th>Name</th>
<th>Title</th>
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</thead>
<tbody>
<tr>
<td>Sarah J. Adamowicz</td>
<td>Associate Professor, Integrative Biology</td>
</tr>
<tr>
<td>R. Ayesha Ali</td>
<td>Associate Professor, Mathematics and Statistics</td>
</tr>
<tr>
<td>Emma Allen-Vercoe</td>
<td>Associate Professor, Molecular and Cellular Biology</td>
</tr>
<tr>
<td>Daniel Ashlock</td>
<td>Professor, Mathematics and Statistics</td>
</tr>
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<td>Christine Baes</td>
<td>Assistant Professor, Animal Biosciences</td>
</tr>
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<td>Elizabeth Boulding</td>
<td>Professor, Integrative Biology</td>
</tr>
<tr>
<td>Angela Canovas</td>
<td>Assistant Professor, Animal Biosciences</td>
</tr>
<tr>
<td>David Chiu</td>
<td>Professor, Computer Science</td>
</tr>
<tr>
<td>Joseph Colasanti</td>
<td>Associate Professor, Molecular and Cellular Biology</td>
</tr>
<tr>
<td>Brenda L. Coomber</td>
<td>Professor, Biomedical Sciences</td>
</tr>
<tr>
<td>Karl Cottenie</td>
<td>Associate Professor, Integrative Biology</td>
</tr>
<tr>
<td>Roy G. Danzmann</td>
<td>Professor, Integrative Biology</td>
</tr>
<tr>
<td>Lorna Deeth</td>
<td>Assistant Professor, Mathematics and Statistics</td>
</tr>
<tr>
<td>Hermann Eberl</td>
<td>Professor and Canada Research Chair, Mathematics and Statistics</td>
</tr>
<tr>
<td>Michael J. Emes</td>
<td>Professor, Molecular and Cellular Biology</td>
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<tr>
<td>Zeny Feng</td>
<td>Associate Professor, Mathematics and Statistics</td>
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<tr>
<td>Steffen Graether</td>
<td>Associate Professor, Molecular and Cellular Biology</td>
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<tr>
<td>T. Ryan Gregory</td>
<td>Associate Professor, Integrative Biology</td>
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<td>Cortland K. Griswold</td>
<td>Associate Professor, Integrative Biology</td>
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<tr>
<td>Mehrdad Hajibaei</td>
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<tr>
<td>Andrew Hamilton-Wright</td>
<td>Associate Professor, Computer Science</td>
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<tr>
<td>Robert Hanner</td>
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<td>George Harauz</td>
<td>Professor and Canada Research Chair, Molecular and Cellular Biology</td>
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<tr>
<td>Andreas Heyland</td>
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</table>

Associate Professor, Integrative Biology

Julie Horrocks
Professor and Associate Chair, Mathematics and Statistics

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Associate Professor, Biomedical Sciences

Niel A. Karrow
Associate Professor, Animal Biosciences

Stefan Keller
Assistant Professor, Pathobiology

Peter Kim
Professor, Mathematics and Statistics

Stefan C. Kremers
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Jonathan LaMarre
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Brandon N. Lillie
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Lewis Lukens
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John Lumsden
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George van der Merve
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Terry Van Raay
Associate Professor, Molecular and Cellular Biology

Geoffrey Wood
Associate Professor, Pathobiology

Associated Graduate Faculty

Sanjeena Dang
BSc, MSc, PhD Guelph - Assistant Professor, Bingham University

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

Paul McNicholas

IX. Graduate Programs, Bioinformatics

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
Dirk Steinke

BSc, MSC University of Konstanz, PhD Goethe University Frankfurt - Associate Director, Centre for Biodiversity Genomics and Adjunct Professor, Integrative Biology

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.

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

- BINF*6110 Genomic Methods for Bioinformatics
- BINF*6210 Software Tools for Biological Data Analysis and Organization
- BINF*6890 Topics in Bioinformatics
- BINF*6970 Statistical Bioinformatics
- BINF*6999 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 the Bioinformatics Graduate Faculty has agreed to be the advisor.

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

- BINF*6110 Genomic Methods for Bioinformatics
- BINF*6210 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.

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

- BINF*6500 [1.00] PhD Research Writing in Bioinformatics

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.

Collaborative Specializations

Artificial Intelligence

The MSc in Bioinformatics program participates in the collaborative specialization in Artificial Intelligence. MSc students wishing to undertake thesis research with an emphasis on artificial intelligence are eligible to apply to register concurrently in Bioinformatics and the collaborative specialization. Students should consult the Artificial Intelligence listing for more information.

Courses

Bioinformatics Core Courses

<table>
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<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>BINF*6110</td>
<td>Genomic Methods for Bioinformatics</td>
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<tr>
<td>BINF*6210</td>
<td>Software Tools for Biological Data Analysis and</td>
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<td>Organization</td>
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<tr>
<td>BINF*6890</td>
<td>Topics in Bioinformatics</td>
<td>0.50</td>
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<tr>
<td>BINF*6970</td>
<td>Statistical Bioinformatics</td>
<td>0.50</td>
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<tr>
<td>BINF*6999</td>
<td>Bioinformatics Master’s Project</td>
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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.

Restriction(s): Restricted to students in Bioinformatics programs. Students in other programs may consult with course instructor.

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

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<tr>
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<td>Organization</td>
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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.

Restriction(s): Restricted to students in Bioinformatics programs. Students in other programs may consult with course instructor.

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

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<tr>
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<tr>
<td>BINF*6410</td>
<td>Bioinformatics Programming</td>
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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.

Restriction(s): Restricted to students in Bioinformatics programs. Students in other programs may consult with course instructor.

Department(s): Dean's Office, College of Biological Science
**BINF*6420 Biosequence Pattern Analysis W [0.50]**

This course is an overview course on different approaches to analyze biological sequences. Basic concepts are introduced, as well as related algorithms.

*Restriction(s):* Restricted to students in Bioinformatics programs. Students in other programs may consult with course instructor.

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

**BINF*6500 PhD Research Writing in Bioinformatics F,W,S [1.00]**

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.

*Restriction(s):* PhD students in Bioinformatics program

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

**BINF*6890 Topics in Bioinformatics F [0.50]**

Selected topics in bioinformatics will be covered. The course might focus on biological or informatics topics, or upon a mixture of both.

*Restriction(s):* Restricted to students in Bioinformatics programs. Students in other programs may consult with course instructor.

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

**BINF*6970 Statistical Bioinformatics W [0.50]**

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.

*Prerequisite(s):* Introductory courses in statistics, mathematics and programming

*Restriction(s):* Restricted to students in Bioinformatics programs. Students in other programs may consult with course instructor.

*Department(s):* 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

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**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.

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**Electives**

**Biological Sciences**

- ANSC*6370 [0.50] Quantitative Genetics and Animal Models
- HNNS*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 seven major fields:

- Reproductive Biology and Development
- Cellular and Molecular Basis of Health & Disease
- Cancer Biology
- Cardiovascular Physiology
- Stem Cell Biology and Regenerative Medicine
- Biomedical Toxicology and Pharmacology
- Neuroscience

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

Administrative Staff

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Laura Favetta
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DVM, PhD Guelph - Professor

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

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Roger A. Moorehead
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W. Glen Pyle
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Tarek M. Saleh
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Alastair J.S. Summerrlee
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BA Cambridge, MSc, PhD Toronto - Professor

Matthew Vickaryous
BSc, MSc Calgary, PhD Dalhousie - Associate Professor

Alicia Viloría-Petit
BSc, MSc Calgary, PhD Toronto - Assistant Professor

Associated Graduate Faculty

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

MBS program

Students may wish to focus their Master of Biomedical Sciences in a range of subject areas, including: 1) reproductive biology and development; 2) cellular and molecular basis of health and disease; 3) cancer biology; 4) cardiovascular physiology; 5) stem cell biology and regenerative medicine; 6) biomedical toxicology and pharmacology; and 7) 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. Research projects may also involve pedagogical research related to teaching in the biomedical sciences. Practicum experiences, also varied in topic and nature, expose students to real-world applications of their areas of study, and connect them with employers in government agencies, consulting firms, research organizations, etc.

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 area of interest 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 courses and displays current research ability to their advisory committee. These courses will be credited to the degree program.

Program 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. As part of their studies, all MBS students must complete either a research project through BIOM*6900 or an applied practicum through BIOM*6900. The remaining courses selected will depend on the student's prior experience and the nature of the research project or practicum. All students are required to present a poster seminar as a component of BIOM*6900 or BIOM*6910. The program is completed when all components of BIOM*6900 or BIOM*6910 have been submitted and the related written report is deemed appropriate by the student's Advisory 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 health and disease; 3) cancer biology; 4) cardiovascular physiology; 5) stem cell biology and regenerative medicine; 6) biomedical toxicology and pharmacology; and 7) 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 their advisory committee. These courses will be credited to the degree program.

Program 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 health and disease; 3) cancer biology; 4) cardiovascular physiology; 5) stem cell biology and regenerative medicine; 6) biomedical toxicology and pharmacology; and 7) 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.

Program 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.

One Health

The Department of Biomedical Sciences participates in the collaborative specialization in One Health. Master’s and Doctoral students wishing to undertake thesis research or their major research paper/project with an emphasis on one health are eligible to apply to register concurrently in Biomedical Sciences and the collaborative specialization. Students should consult the One Health listing for more information.

Toxicology

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

Courses

BIOM*6070 Pregnancy, Birth and Perinatal Adaptations S [0.50]  
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.  
Department(s): Department of Biomedical Sciences

BIOM*6110 Research Methods in Biomedical Sciences F-W [0.50]  
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.)  
Department(s): Department of Biomedical Sciences

BIOM*6130 Vertebrate Developmental Biology U [0.50]  
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.  
Department(s): 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 Medical 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 literature (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 Applied Reproductive Biotechnologies F-W [0.50]
The production of embryos in the laboratory requires considerable manual dexterity and expertise as well as theoretical knowledge and problem-solving skills. This is a 2-semester course consisting of laboratory training in bovine in vitro embryo production, seminars, field trips, group discussions and the placement in IVF clinics.

**Restriction(s):** Instructor consent required.

**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

### BIOM*6910 Practicum in Biomedical Sciences S [1.00]
This is a one-semester practicum project course for students in the Master of Biomedical Sciences (MBS) program. Students receive applied training by working in a host organization or agency for a 12- to 14-week period, focusing on a major project of significance to the host.

**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.

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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.

Program 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.
Program 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] | Department(s): Dean’s Office, College of Engineering and Physical Sciences |
| BIOP*6010 Biophysics Seminar U [0.00] | This public research seminar is based on presentations by all PhD students in the Biophysics program in yearly intervals after passing the qualifying exam and by all MSc students in their second year of studies. Students are required to attend all seminars presented during the semester in which they are registered for the course. |
| 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. |
| 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. |
| 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. Offered in conjunction with PHYS*4070. Extra work is required of graduate students. |
| 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. |
| PHYS*7540 Special Topics in Biophysics U [0.50] | Offered on demand |
| PHYS*7570 Special Topics in Biophysics U [0.25] | Offered on demand |

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*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

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:
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.

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**Graduate Faculty**

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

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**From the Department of Physics**

John R. Dutcher
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**From the Department of Plant Agriculture**

K. Peter Paul
BSc, MSc, PhD Waterloo - Professor
MBIOT Program

Admissions Requirements

Students entering the program will normally have completed an Honours Bachelor's degree with a minimum average grade 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.

Program Requirements

A total of 4.0 course credits are required to graduate, which must include BIOT*6500, BIOT*6650, 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

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<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tr>
<td>BIOT*6500</td>
<td>Molecular Biotechnology F</td>
<td>0.50</td>
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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.  

Department(s): Department of Molecular and Cellular Biology

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<tr>
<td>BIOT*6550</td>
<td>Biodiversity and Biotechnology W</td>
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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.  

Department(s): Department of Molecular and Cellular Biology

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<tr>
<td>BIOT*6600</td>
<td>Innovation Management F</td>
<td>0.50</td>
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This course will focus on the integration of science and business from initial discovery 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. 

Department(s): Department of Management

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<tr>
<td>BIOT*6610</td>
<td>Cases in Biotechnology Management W</td>
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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.  

Prerequisite(s): BIOT*6600  

Department(s): Department of Management
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:

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

Administrative Staff

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

Associate Dean, Research and Graduate Studies
Sean Lyons (314 Macdonald Hall, Ext. 58500)
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Director, Executive Programs
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Graduate Program Coordinator MBA Hospitality and Tourism Management
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Graduate Program Coordinator MBA Food and Agribusiness Management
Andreas Boecker (314 Macdonald Hall, Ext. 53532)
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Rumina Dhalla
Graduate Program Coordinator MBA Sustainable Commerce

Graduate Faculty

The MBA program is administered and managed by the Gordon S. Lang School of Business and Economics, 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 LANG), the School of Hospitality, Food and Tourism Management (in LANG), the Department of Economics and Finance (in LANG) and the Department of Marketing and Consumer Studies (in LANG).

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 Alemany, PhD Alberta - Associate Professor

Spencer Henson
BSc, PhD Reading - Professor

Rakhal C. Sarker
BSc, MSc Bangladesh, PhD Guelph - Associate Professor

Michael von Massow
BA Manitoba, BSc, MSc Guelph, PhD McMaster - Assistant 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 (LANG):

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BA York, MBA, PhD McMaster - Associate Professor

Elliott Currie
BA, MBA McMaster, CPA, CMA - Associate Professor

Rumina Dhalla
MBA, PhD York - Associate Professor

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

Kalinga Jagoda
BSc Moratuwa, PhD Western Sydney, CPA, CMA - Associate Professor

Elizabeth Kurucz
BA McMaster, MIR Toronto, PhD York - Associate Professor

Sean Lyons
BPA Windsor, MA, PhD Ottawa - Professor and Associate Dean, Research and Graduate Studies, Gordon S. Lang School of Business and Economics

Sara Mann
BComm MBA McMaster, PhD Toronto - Professor, Interim Dean and Associate Dean Academic, Gordon S. Lang School of Business and Economics

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

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

Trent Tucker
BSc Alberta, MBA Toronto, PhD Waterloo - Assistant Professor

John Walsh
BA Thames Polytechnic, MBA, PhD Western Ontario - Professor

Agnes Zdniuk
BA Waterloo, MASc, PhD Waterloo - Associate Professor

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

Hwan-Suk (Chris) Choi
BA Chung-Ang (Seoul, Korea), MTA George Washington, PhD Texas A&M - Professor and Acting Director, School of Hospitality, Food and Tourism Management

Julia Christensen Hughes
BComm Guelph, MBA, PhD York - Professor

Statia Elliot
BComm St. Mary's, MA McMaster, PhD Carleton - Professor and Interim Associate Dean, External Relations, Gordon S. Lang School of Business and Economics

Joan Flaherty
BA, MA, MSc, Guelph - Assistant Professor

Lianne Foti
BComm Guelph, MBA EDHEC, DBA Bradford - Assistant Professor

Mark Holmes
BComm, MSA Ryerson, PhD York - Assistant Professor

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

Nadège Levallé
MMGT Grenoble, MBA Ottawa, PhD Queen's - Assistant Professor

Bruce McAdams
BComm, MA Guelph - Assistant Professor

Norm O'Reilly
BSc Waterloo, MBA Ottawa, PhD Carleton - Professor and Director, International Institute for Sport Business and Leadership, School of Hospitality, Food and Tourism Management

Erna van Duren
BA Waterloo, MSc, PhD Guelph - Professor

From the Department of Economics and Finance (LANG)

Francis Tapon
MBA Columbia, MA, PhD Duke - Professor

From the Department of Marketing and Consumer Studies (LANG):

May H. Aung
BComm, MCom Burma, PhD York - Associate Professor

MBA Program

The MBA program is offered in three broad fields: 1) food and agribusiness management; 2) hospitality and tourism management; and 3) sustainable commerce and involves a core group of courses that build and develop key managerial skills. These courses 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. At least three years of industry-related experience (without supervisory and managerial responsibility) and a GMAT (with a minimum score of 550-600).

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.
Program 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 online coursework and three on-site residential periods.

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

Online courses are offered as eight-week modules that require approximately 20-25 hours of study per week. With access to the internet, you can study anywhere, anytime with the flexibility that enables you to balance family, career and study priorities.

The three on-site residential periods 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]** Business Fundamentals
- **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 the Gordon S. Lang School of Business and Economics, 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 taking two additional elective courses or by completing 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 taking two additional elective courses or by completing 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 the Gordon S. Lang School of Business and Economics 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 MBA within two years. Courses are completed in sequence and each course is 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 the on-campus program is not accepting applications 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 completing fourteen courses.

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

**Computer Systems Requirements**

**Online 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 the 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 computer requirements contact our program administrative staff or visit our MBA web site: [http://www.mba.uoguelph.ca/](http://www.mba.uoguelph.ca/)

**Courses**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Department(s)</th>
<th>Restriction(s)</th>
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<tr>
<td>BUS*6150</td>
<td>Research Methods for Managers U [0.50]</td>
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<td>Students learn to formulate a research problem and to select and use appropriate quantitative and qualitative techniques for the collection and analysis of relevant data. The course also covers ethical issues and responsibilities in research.</td>
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|             |                                                 |              | **Restriction(s):** Lang 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 by managers to contribute towards overall corporate vision and exercise fiscal responsibility towards overall corporate results and governance.                                             |
|             |                                                 |              | **Restriction(s):** Lang Executive Programs students only  
|             |                                                 |              | **Department(s):** Executive Programs  
| BUS*6200    | Financial Management U [0.50]                    |              | This course takes the viewpoint of a senior financial officer, focusing on cash management, accounts receivable, inventories and capital assets, and sourcing of funds through debt and equity. Business decision impacts on employees and customers, society and community, government relations, and the environment are considered.        |
|             |                                                 |              | **Restriction(s):** BUS*6180  
|             |                                                 |              | **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):** Lang 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):** Lang 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. |
|             |                                                 |              | **Restriction(s):** Lang Executive Programs students only  
|             |                                                 |              | **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):** Lang 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):** Lang Executive Programs 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):** Lang Executive Programs students only  
|             |                                                 |              | **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):** Lang Executive Programs 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):** Lang 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):** Lang 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):** Lang 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):** Lang 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):** Lang Executive Programs students only  
|             |                                                 |              | **Department(s):** Executive Programs  
| BUS*6700    | Strategic Management & Business Game U [0.50]    |              | This course examines the study of business in a global context through a "live case study," with specific emphasis on the strategic implications of food, hospitality, agribusiness, and sustainable commerce. This integrative course draws together the conceptual theories and models of the graduate program core. |
|             |                                                 |              | **Restriction(s):** Lang Executive Programs students only  
|             |                                                 |              | **Department(s):** Executive Programs  
| BUS*6790    | Operations Management U [0.50]                   |              | This course delves into key decisions and techniques used to provide a good or service and deliver customer value in today's global. The focus is on modelling service and product delivery systems with emphasis on managerial problems in hospitality, tourism, food and agribusiness organizations. |
|             |                                                 |              | **Restriction(s):** Lang 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. |
|             |                                                 |              | **Restriction(s):** Lang Executive Programs students only  
|             |                                                 |              | **Department(s):** Executive Programs  

**2019-2020 Graduate Calendar**

January 28, 2020
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
<th>Description</th>
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</table>
| 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): Lang 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): Lang 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

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Graduate Program Coordinator
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allauzon@uoguelph.ca

Graduate Program Assistant
Lorena Barker (104 Landscape Architecture, Ext. 56780)
cde@uoguelph.ca

Graduate Faculty

Ataharul Chowdhury
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Helen Hamblly Odame
BA Toronto, ME.S., PhD York - Associate Professor

Allan C. Lauzon
BA, MSc Guelph, EdD Toronto - Professor

Silvia Sarapura
BSc Central Peru, MSc, PhD Guelph - Assistant Professor

Associated Graduate Faculty

Glen Filson
BA Saskatchewan, MEd Saskatchewan, PhD Toronto - Retired Faculty, School of Environmental Design and Rural Development, University of Guelph

Laxmi Pant
HBSc. Tribhuvan Univeristy (Nepal), MSc Norwegian Univ of Life Sciences, PhD – University of Guelph - Sessional Lecturer, 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. Capacity Development and Extension is a learner centred program and we actively support and encourage learners to seek learning opportunities to complement their formal coursework.

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. You should consult with your advisor or the graduate coordinator prior to enrolling in open electives.

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 rural community is preferred.

Students in Capacity Development and Extension have employment opportunities in areas such as nonprofit and social enterprise organizations, community development, non-formal education, communication technology, agricultural extension and applied research, health, development project management and program analysis, and technology transfer.

Program Requirements

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

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

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

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.
  Department(s): 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.
  Department(s): 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.
  Restriction(s): Instructor consent required.
  Department(s): School of Environmental Design and Rural Development

- EDRD*6000 [0.50] Qualitative Analysis in Rural Development

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

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.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Description</th>
<th>Restriction(s)</th>
<th>Department(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CDE*6330</td>
<td>Facilitation and Conflict Management U [0.50]</td>
<td>0.50</td>
<td>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.</td>
<td>Instructor consent required.</td>
<td>School of Environmental Design and Rural Development</td>
</tr>
<tr>
<td>CDE*6410</td>
<td>Readings in Capacity Building and Extension U [0.50]</td>
<td>0.50</td>
<td>A program of supervised independent study related to the student’s area of concentration.</td>
<td>Instructor consent required.</td>
<td>School of Environmental Design and Rural Development</td>
</tr>
<tr>
<td>CDE*6420</td>
<td>Communication for Social and Environmental Change U [0.50]</td>
<td>0.50</td>
<td>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.</td>
<td>Instructor consent required.</td>
<td>School of Environmental Design and Rural Development</td>
</tr>
<tr>
<td>CDE*6690</td>
<td>Community Environmental Leadership U [0.50]</td>
<td>0.50</td>
<td>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.</td>
<td>Instructor consent required.</td>
<td>School of Environmental Design and Rural Development</td>
</tr>
</tbody>
</table>
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
Elizabeth Meiering (ESC 228, University of Waterloo, (519) 888-4567, Ext. 32254)
gwc@uwaterloo.ca

Administrative Assistant for the Centre
Kim Rawson (263 Chemistry 2 Bldg., Univ. of Waterloo, (519) 888-4567 or (519) 824-4120, Ext. 3811/53484)
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France-Isabelle Auzanneau
Maitrise, DEA, PhD Paris XI-Orsay - Professor

Aicheng Chen
Diploma, Shaoyang University, MSc, Xiamen University, PhD Guelph - Professor, Director of the Electrochemical Technology Centre

Michael K. Denk
Diplom-Chemiker, PhD Ludwig-Maximilians Universität Munich - Associate Professor

Wojciech Gabryelski
BSc, MSc Technical University of Gdansk (Poland), PhD Alberta - Associate Professor

Khushayar Ghandi
BSc Shiraz University, MSc University of Tehran, PhD, Simon Fraser University - Professor

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

Lori Jones
BSc New Brunswick, PhD Guelph - Associate Professor

Richard A. Manderville
BSc, PhD Queen's - Professor

Mario A. Monteiro
BSc, PhD York University - 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 and Chair

Marcel Schlaf
Diplom-Chemiker Bayerische Julius-Maximilian Universität, PhD Toronto - Professor and Graduate Program Coordinator

Adrian L. Schwan
BSc Western Ontario, PhD McMaster - Professor

Dmitry 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 and NSERC Industrial Research Chair

Graduate Faculty from University of Waterloo

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

Jonathan Baugh
BSc Tennessee (Chattanooga), PhD North Carolina (Chapel Hill) - Assistant 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 Dubamal
BEng, MSc, PhD (ENSIC, Nancy, France) - Professor and Canada Research Chair

Eric Fillion
BSc Sherbrooke, MSc Montreal, PhD Toronto - Professor

Mario Gauthier
BSc, PhD McGill - Professor

Tadeusz Gorecki
MSc, PhD (Technical University of Gdansk) - 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

Vassili Karanassios
BSc Thessaloniki, PhD Alberta - Professor

Holger Kleinke
BSc, MSc Westfälische-Universität Münster, PhD Johannes-Gutenberg Universität Mainz - Professor and Canada Research Chair

Anna Klinskova
B.Sc., Saint Petersburg State University, Russia, M.Sc., Bowling Green State University, Ph.D., Toronto - Assistant Professor

Sonny C. Lee
BS California Institute of Technology, PhD Harvard - Associate Professor

Bob Lemieux
BA(Hons.), Colgate University (New York), PhD Illinois (Urbana) - Professor and Dean of Science

K. Tong Leung
BSc, PhD British Columbia - Professor

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

Vivek Maheshwari
B.Tech Delhi, MSc Wayne State, PhD Virginia - Assistant Professor

Terrance B. McMahon
BSc, PhD California Institute of Technology - University Professor and Dean of Science

Elizabeth M. Meiering
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Susan R. Mikkelsen
BSc (British Columbia), PhD (McGill) - Professor

Graham K. Murphy
BSc (Victoria BC), PhD (Alberta) - Assistant Professor
IX. Graduate Programs, Chemistry

Linda F. Nazar
BSc British Columbia, PhD Toronto - Professor and Canada Research Chair

Marcel Nooljen
BSc, PhD Vrije Universiteit van Amsterdam - Associate 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

William P. Power
BSc, PhD Dalhousie - Associate Professor and Department Chair

Eric Prouzet
MS, PhD Nantes - Associate Professor

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

Pierre-Nicholas Roy
BSc McGill University, MSc. and PhD, Université de Montréal - Professor and Tier 1 Canada Research Chair in Quantum Molecular Dynamics

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

German Sciaini
BSc, PhD University of Buenos Aires - Associate Professor

Rodney Smith
BSc Honours University of Manitoba, PhD Memorial University of Newfoundland - Assistant 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 Yang
BSc, MSc Zhejiang University, PhD East China University of Science & Technology - Associate Professor

Adam Wei Tsen
BS University of California, Berkeley, PhD Cornell University, New York - 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 they have 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).

Program Requirements

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

Thesis

Students must successfully complete at least four semester-long graduate courses, one of which is the 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.

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.

Collaborative Specializations

Toxicology

The Department of Chemistry participates in the masters/doctoral collaborative specialization in toxicology. Please consult the Toxicology listing for a detailed description of the masters/doctoral 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

CHEM*7100 Selected Topics in Inorganic Chemistry U [0.50]
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.
Department(s): Department of Chemistry

CHEM*7120 X-ray Crystallography U [0.50]
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.
Department(s): Department of Chemistry

CHEM*7130 Chemistry of Inorganic Solid State Materials U [0.50]
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.
Department(s): Department of Chemistry

CHEM*7150 Structure and Bonding in Inorganic Chemistry U [0.50]
Free electron, Hueckel and extended Hueckel 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.
Department(s): Department of Chemistry

CHEM*7170 Advanced Transition Metal Chemistry U [0.50]
Magnetoochemistry 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 hybri des, metal-metal bonded species, biologically significant model systems such as macrocycles.
Department(s): Department of Chemistry

CHEM*7180 Advanced Organometallic Chemistry U [0.50]
Reactions, structure and bonding of organometallic compounds of transition and non-transition metals.
Department(s): Department of Chemistry

Analytical

CHEM*7200 Selected Topics in Analytical Chemistry U [0.50]
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.
Department(s): Department of Chemistry

CHEM*7240 Chemical Instrumentation U [0.50]
Instrumental components and optimum application; rudiments of design; electrical, spectral, migrational and other methods.
Department(s): Department of Chemistry

CHEM*7260 Topics in Analytical Spectroscopy U [0.50]
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.
Department(s): Department of Chemistry

CHEM*7270 Separations U [0.50]
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-FTRIR; electrophoresis, flow field fractionation. Prerequisites: undergraduate level course in instrumental analysis.
Department(s): Department of Chemistry

CHEM*7280 Electroanalytical Chemistry U [0.50]
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.
Department(s): Department of Chemistry

CHEM*7290 Surface Analysis U [0.50]
Department(s): Department of Chemistry

Biochemistry

CHEM*7300 Proteins and Nucleic Acids U [0.50]
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.
Department(s): Department of Chemistry

CHEM*7310 Selected Topics in Biochemistry U [0.50]
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.
Department(s): Department of Chemistry

CHEM*7360 Regulation in Biological Systems U [0.50]
Department(s): Department of Chemistry

CHEM*7370 Enzymes U [0.50]
Department(s): Department of Chemistry

CHEM*7380 Cell Membranes and Cell Surfaces U [0.50]
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.
Department(s): Department of Chemistry

Physical/Theoretical

CHEM*7400 Selected Topics in Theoretical Chemistry U [0.50]
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.
Department(s): Department of Chemistry

CHEM*7450 Statistical Mechanics U [0.50]
Review of classical and quantum mechanics; principles of statistical mechanics; applications to systems of interacting molecules; imperfect gases, liquids, solids, surfaces and solutions.
Department(s): Department of Chemistry

CHEM*7460 Quantum Chemistry U [0.50]
Approximate solutions of the Schrodinger equation and calculations of atomic and molecular properties.
Department(s): Department of Chemistry

CHEM*7500 Selected Topics in Physical Chemistry U [0.50]
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.
Department(s): Department of Chemistry

CHEM*7550 Kinetics - Dynamics U [0.50]
Department(s): Department of Chemistry
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Department(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM*7560</td>
<td>Spectroscopy U [0.50]</td>
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<td>Department of Chemistry</td>
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<td></td>
<td>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.</td>
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<td>Department(s): Department of Chemistry</td>
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<tr>
<td>CHEM*7600</td>
<td>Selected Topics in Organic Chemistry U [0.50]</td>
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<td>Department of Chemistry</td>
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<td></td>
<td>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.</td>
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<td>Department(s): Department of Chemistry</td>
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<tr>
<td>CHEM*7640</td>
<td>Synthetic Organic Reactions U [0.50]</td>
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<td>Department of Chemistry</td>
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<td></td>
<td>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.</td>
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<td>Department(s): Department of Chemistry</td>
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<tr>
<td>CHEM*7650</td>
<td>Strategies in Organic Synthesis U [0.50]</td>
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<td>Department of Chemistry</td>
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<td></td>
<td>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.</td>
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<td></td>
<td>Prerequisite(s): CHEM*7640</td>
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<td>Department of Chemistry</td>
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<td>Department(s): Department of Chemistry</td>
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<tr>
<td>CHEM*7660</td>
<td>Organic Spectroscopy U [0.50]</td>
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<td>Department of Chemistry</td>
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<td></td>
<td>Ultraviolet, infrared, resonance spectroscopy and mass spectrometry, with emphasis on applications to studies of organic molecules.</td>
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<td>Department(s): Department of Chemistry</td>
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<tr>
<td>CHEM*7690</td>
<td>Physical Organic Chemistry U [0.50]</td>
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<td>Department of Chemistry</td>
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<td>Linear free energy relationships; substituent effects and reactive intermediates.</td>
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<td>Department(s): Department of Chemistry</td>
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<tr>
<td>CHEM*7700</td>
<td>Principles of Polymer Science U [0.50]</td>
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<td>Department of Chemistry</td>
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<td></td>
<td>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.</td>
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<td>Department(s): Department of Chemistry</td>
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<tr>
<td>CHEM*7710</td>
<td>Physical Properties of Polymers U [0.50]</td>
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<td>Department of Chemistry</td>
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<td></td>
<td>The physical properties of polymers are considered in depth from a molecular viewpoint. Rubber elasticity, mechanical properties, rheology and solution behaviour are quantitatively treated.</td>
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<td></td>
<td>Prerequisite(s): CHEM*7700 or equivalent</td>
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<td>Department of Chemistry</td>
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<td>Department(s): Department of Chemistry</td>
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<tr>
<td>CHEM*7720</td>
<td>Polymerization and Polymer Reactions U [0.50]</td>
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<td>Department of Chemistry</td>
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<td></td>
<td>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.</td>
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<tr>
<td></td>
<td>Prerequisite(s): CHEM*7700 or equivalent</td>
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<td>Department of Chemistry</td>
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<td>Department(s): Department of Chemistry</td>
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<tr>
<td>CHEM*7730</td>
<td>Selected Topics in Polymer Chemistry U [0.50]</td>
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<td>Department of Chemistry</td>
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<td></td>
<td>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.</td>
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<td>Department(s): Department of Chemistry</td>
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<tr>
<td>CHEM*7940</td>
<td>MSc Seminar U [0.50]</td>
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<td>Department of Chemistry</td>
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<td>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.</td>
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<td>Department(s): Department of Chemistry</td>
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<tr>
<td>CHEM*7950</td>
<td>PhD Seminar U [0.00]</td>
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<td>Department of Chemistry</td>
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<td></td>
<td>An experimental project normally based on the CHEM<em>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</em>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.</td>
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<td>Department(s): Department of Chemistry</td>
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<tr>
<td>CHEM*7980</td>
<td>MSc Thesis U [0.00]</td>
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<td>Department of Chemistry</td>
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<td>Department(s): Department of Chemistry</td>
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<tr>
<td>CHEM*7990</td>
<td>PhD Thesis U [0.00]</td>
<td></td>
<td>Department of Chemistry</td>
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<td></td>
<td>Department(s): Department of Chemistry</td>
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</tr>
</tbody>
</table>

January 28, 2020
Clinical Studies

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

Administrative Staff

Chair
Carolyn Kerr (2141 OVC, Ext. 54051)
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Graduate Program Assistant - DVSc
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Graduate Program Assistant - MSc and GDip
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Graduate Faculty

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BA Alberta, DVM Saskatchewan, DVSc Guelph, Dipl. ACVIM - Professor

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BSc, DVM, MSc Guelph, Dipl. ACVECC - Associate Professor

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BSc, Mount Allison, DVM Prince Edward Island, DVSc Guelph, Dipl. ACVIM - Associate Professor

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Heather Chalmers
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Alice Defarges
DVM France (Alfort), MSc Montreal, Dipl. ACVIM - Assistant Professor

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

Louis Gaitero
DVM, Diplomate ECVN - Associate Professor

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

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

Samuel Hooker
BS Illinois, DVM, MS Kansas - Assistant Professor

Mark M. Huritig
DVM Guelph, MVSc Saskatchewan, Dipl. ACVS - Professor

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HBSc Toronto, MSc Western, DVM, DVSc Guelph, Dipl. ACVIM - Assistant Professor

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Judith Koenig
DVM, MSc Vet. Medicine (Austria), DVSc Guelph, Dipl. ACVS/ECVS - Associate Professor

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

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Michelle Oblak
DVM, DVSc Guelph, Dipl. ACVS - Assistant Professor

Chantale Pinard
DVM Guelph, MS Kansas State, Dipl. ACVO - Associate Professor

Andrea Sanchez Lazaro
DVM Murcia, DVSc Guelph - Assistant Professor

Melissa Sinclair
DVM Prince Edward Island, DVSc Guelph, Dipl. ACVAA - Associate Professor

Ameet Singh
BSc, Mount Allison, DVM Atlantic Veterinary College, DVSc Guelph, Dipl. ACVS - Assistant Professor

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. ECVCN - Assistant Professor

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

Alexander Zur Linden
BSc Simon Fraser, DVM Saskatchewan DACVR - Assistant Professor

Associated Graduate Faculty

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Lynee O'Sullivan
DVM Prince Edward Island, DVSc Guelph, Dipl. ACVIM - Associate Professor, Atlantic Veterinary College

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.

Program 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 their ability to develop a research project, prepare a manuscript suitable for publication in a peer-reviewed scientific journal, and present their work in a Departmental seminar. A mark will be assigned by the advisory committee, based on the manuscript and oral presentation.

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 offered 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.

Ameet Singh
BSc, Mount Allison, DVM Atlantic Veterinary College, DVSc Guelph, Dipl. ACVS - Assistant Professor

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

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

Alexander Zur Linden
BSc Simon Fraser, DVM Saskatchewan DACVR - Assistant Professor
**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 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.

**Program 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.

**Program 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**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>CLIN*6010</td>
<td>Clinical Medicine F [0.50]</td>
<td>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.</td>
</tr>
<tr>
<td>CLIN*6030</td>
<td>Clinical Medicine W [0.50]</td>
<td>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.</td>
</tr>
<tr>
<td>CLIN*6031</td>
<td>Clinical Medicine S [0.50]</td>
<td>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.</td>
</tr>
<tr>
<td>CLIN*6190</td>
<td>Neurology F [0.50]</td>
<td>Basic principles of lesion localization in the domestic species with discussions of diagnostic problems in veterinary neurology. Offered alternate years.</td>
</tr>
<tr>
<td>CLIN*6200</td>
<td>Concepts and Application of Infection Control U [0.50]</td>
<td>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.</td>
</tr>
<tr>
<td>CLIN*6380</td>
<td>Electrocadiography in Domestic Animals F,W,S [0.50]</td>
<td>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.</td>
</tr>
<tr>
<td>CLIN*6550</td>
<td>Small Animal Internal Medicine I U [0.50]</td>
<td>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. The subject area(s) will be one or two organ systems, which will not be repeated in either CLIN<em>6550 or CLIN</em>6560 over a 3-year period.</td>
</tr>
<tr>
<td>CLIN*6550</td>
<td>Small Animal Internal Medicine II U [0.50]</td>
<td>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. The subject area(s) will be one or two organ systems, which will not be repeated in either CLIN<em>6550 or CLIN</em>6560 over a 3-year period.</td>
</tr>
<tr>
<td>CLIN*6570</td>
<td>Large Animal Internal Medicine I W [0.50]</td>
<td>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.</td>
</tr>
<tr>
<td>CLIN*6580</td>
<td>Large Animal Internal Medicine II W [0.50]</td>
<td>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.</td>
</tr>
<tr>
<td>CLIN*6590</td>
<td>Large Animal Internal Medicine III W [0.50]</td>
<td>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.</td>
</tr>
<tr>
<td>CLIN*6661</td>
<td>Respiratory Physiology &amp; Pathophysiology U [0.50]</td>
<td>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).</td>
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<tr>
<td>Course Code</td>
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<tr>
<td>CLIN*6670</td>
<td>Structure &amp; Function of Animal Skin F,W,S [0.50]</td>
<td>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. Instructor consent required.</td>
</tr>
<tr>
<td>CLIN*6680</td>
<td>Readings in Cardiology I F,W,S [0.50]</td>
<td>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.</td>
</tr>
<tr>
<td>CLIN*6690</td>
<td>Readings in Cardiology II F,W,S [0.50]</td>
<td>Readings in Cardiology II will be a continuation of the format of Readings in Cardiology I with further readings in clinical cardiology.</td>
</tr>
<tr>
<td>CLIN*6960</td>
<td>Special Topics: Zoological Med F,W [0.50]</td>
<td>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). Instructor consent required.</td>
</tr>
<tr>
<td>CLIN*6170</td>
<td>Clinical Surgery F [0.50]</td>
<td>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 sub-specialty 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.</td>
</tr>
<tr>
<td>CLIN*6180</td>
<td>Clinical Surgery W [0.50]</td>
<td>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 sub-specialty 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.</td>
</tr>
<tr>
<td>CLIN*6181</td>
<td>Clinical Surgery S [0.50]</td>
<td>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 sub-specialty 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.</td>
</tr>
<tr>
<td>CLIN*6270</td>
<td>Applied Surgical Principles U [0.25]</td>
<td>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.</td>
</tr>
<tr>
<td>CLIN*6310</td>
<td>Advanced Equine Veterinary Orthopaedics U [0.50]</td>
<td>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: DVM or BSc.</td>
</tr>
<tr>
<td>CLIN*6600</td>
<td>Equine Soft Tissue Surgery I F,W,S [0.50]</td>
<td>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.</td>
</tr>
<tr>
<td>CLIN*6610</td>
<td>Equine Soft Tissue Surgery II F,W,S [0.50]</td>
<td>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.</td>
</tr>
<tr>
<td>CLIN*6620</td>
<td>Ruminant Surgery W [0.50]</td>
<td>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.</td>
</tr>
<tr>
<td>CLIN*6700</td>
<td>Pathophysiology in Small Animal Surgery I F,W,S [0.50]</td>
<td>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.</td>
</tr>
<tr>
<td>CLIN*6710</td>
<td>Pathophysiology in Small Animal Surgery II F,W,S [0.50]</td>
<td>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.</td>
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**Anesthesiology**

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<tr>
<th>Course Code</th>
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<tbody>
<tr>
<td>CLIN*6420</td>
<td>Anesthesiology I S [0.50]</td>
<td>A course in advanced veterinary anesthesia and allied topics such as fluid, acid-base, and electrolyte balance, shock therapy, and cardio pulmonary resuscitation.</td>
<td>Department of Clinical Studies</td>
</tr>
<tr>
<td>CLIN*6440</td>
<td>Anesthesiology II F,W,S [0.50]</td>
<td>A discussion, reading and investigative course on research methods in comparative anesthesiology.</td>
<td>Department of Clinical Studies</td>
</tr>
<tr>
<td>CLIN*6460</td>
<td>Anesthesiology III: Species Specific and Coexisting Disease Considerations F-W [0.50]</td>
<td>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.</td>
<td>Department of Clinical Studies</td>
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</table>

**Radiology**

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<tbody>
<tr>
<td>CLIN*6330</td>
<td>Advanced Principles of Diagnostic Imaging U [0.50]</td>
<td>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.</td>
<td>Department of Clinical Studies</td>
</tr>
<tr>
<td>CLIN*6350</td>
<td>Advanced Radiology I F,W,S [0.50]</td>
<td>Radiographic changes seen in diseases of the thorax and abdomen are demonstrated by using radiographs. Contrast and special studies are included where applicable.</td>
<td>Department of Clinical Studies</td>
</tr>
<tr>
<td>CLIN*6370</td>
<td>Advanced Radiology II F [0.50]</td>
<td>A continuation of CLIN*6350, covering radiographic abnormalities of the neurological and skeletal systems.</td>
<td>Department of Clinical Studies</td>
</tr>
</tbody>
</table>

**General**

<table>
<thead>
<tr>
<th>Course Code</th>
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</thead>
<tbody>
<tr>
<td>CLIN*6910</td>
<td>Professional Veterinary Communication Competencies F-W [0.50]</td>
<td>This course assists learners in developing professional competencies in several critical areas of professional veterinary practice: 1) the veterinary-patient-client relationship; 2) the preparation and delivery of professional seminars; and 3) clinical teaching in small groups.</td>
<td>Department of Clinical Studies</td>
</tr>
</tbody>
</table>

Restrictions:
- Instructor consent required.
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<tr>
<th>Course Code</th>
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</tr>
</thead>
<tbody>
<tr>
<td>CLIN*6920</td>
<td>Veterinary Clinical Practice I</td>
<td>0.50</td>
<td>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 their 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.</td>
</tr>
<tr>
<td>CLIN*6930</td>
<td>Veterinary Clinical Practice II</td>
<td>0.50</td>
<td>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 their 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.</td>
</tr>
<tr>
<td>CLIN*6940</td>
<td>Veterinary Clinical Practice III</td>
<td>0.50</td>
<td>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 their 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.</td>
</tr>
<tr>
<td>CLIN*6950</td>
<td>Special Topics in Clinical Studies</td>
<td>F,W,S 0.50</td>
<td>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.</td>
</tr>
<tr>
<td>CLIN*6990</td>
<td>Project in Clinical Studies</td>
<td>F,W,S 1.00</td>
<td>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.</td>
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</table>
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

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Graduate Program Assistant
Jennifer Hughes (1116 Reynolds, Ext. 56402)
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Graduate Faculty

From the School of Computer Science

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

Ali Dehghantahanta
BSE Azad, MSc, PhD Putra Malaysia - Assistant Professor

Minglun Gong
BEng Harbin Engineering, MSc Tsinghua, PhD Alberta - Professor and Director

Gary Gréval
BSc Brock, MSc, PhD Guelph - Associate Professor

Andrew Hamilton-Wright
BSc, MSc Guelph, PhD Waterloo - Associate Professor

Hassan Khan
BSc NUST, MSc Southern California, PhD Waterloo – Assistant Professor - Assistant Professor

Stefan C. Kremer
BSc Guelph, PhD Alberta - Associate Professor

Xining Li
BSc, MSc Nanjing, PhD Calgary - Professor

Xiaodong Lin
BASc Nanjing, MSc East China Normal, PhD Beijing, PhD Waterloo - Associate Professor

Pascal Matsakis
BSc, MSc, PhD Paul Sabatier (France) - Professor

Judi R. McCuaig
BEd, BSc, MS, PhD Saskatchewan - Associate Professor

Blair Nonnecke
BSc, MSc Guelph, PhD South Bank - Associate Professor

Charlie F. Obimbo
MSc Kiev, PhD New Brunswick - Associate Professor

Joseph Sawada
BSc, PhD Victoria (British Columbia) - Professor

Stacey Scott
BSc Dalhousie, PhD Calgary - Associate Professor

Fei Song
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Fangju Wang
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Michael A. Wirth
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Yang Xiang
BSs, MSc BUAA (Beijing), PhD UBC - Professor

From the Department of Animal Biosciences

Trevor Devries
BSc, PhD British Columbia - Associate 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, Gordon S. Lang School 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

Fattahun 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

Hadi Karimipour
BSc Ferdowi, MSc Shahrood, PhD Alberta - Assistant 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

Petros Spachos
Diplom Crete, MASc, PhD Toronto - Assistant 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 Food, Agricultural and Resource Economics

Getu Hailu
BSc, MSc Alemaya, PhD Alberta - Professor

From the Department of Food Science

Jeffrey Farber
BSc, MSc, PhD McGill - Professor

From the Department of Geography

Evan Fraser
BA, MSc Toronto, PhD UBC - Professor

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
DVM Tehran, PhD Guelph - Professor

From the Department of Population Medicine

Amy Greer
BSc, Mount Allison, MSc, PhD Arizona State - Assistant Professor

David Pearl
BSc McGill, MSc York, DVM, PhD Guelph - Associate Professor

2019-2020 Graduate Calendar

January 28, 2020
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.

Program 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.

Collaborative Specializations

One Health

Computational Sciences participates in the collaborative specialization in One Health. Master’s and Doctoral students wishing to undertake thesis research or their major research paper/project with an emphasis on one health are eligible to apply to register concurrently in Computational Sciences and the collaborative specialization. Students should consult the One Health listing for more information.

Courses

**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
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**
Minglu Gong (1117 Reynolds, Ext. 52824)
director@socs.uoguelph.ca

**Associate Graduate Director**
Joe Sawada (2226 Reynolds, Ext. 53277)
graddir@socs.uoguelph.ca

**Graduate Program Assistant**
Jennifer Hughes (1116 Reynolds, Ext. 56402)
gradassist@socs.uoguelph.ca

### Graduate Faculty

**David A. Calvert**
BA, MSc Guelph, PhD Waterloo - Associate Professor

**David K.Y. Chiu**
BA Waterlo, BSc Guelph, MSc Queen's, PhD Waterloo - Professor

**Rozita Dara**
BSc Shahid Teheshti, MSc Guelph, PhD Waterloo - Assistant Professor

**Ali Dehghantanha**
BSE Azad, MSc, PhD Putra Malaysia - Assistant Professor

**David Flatla**
BSc, MSc, PhD Saskatchewan - Associate Professor

**Dan Gillis**
BSc, MSc, PhD Guelph - Assistant Professor

**Minglu Gong**
BEng Harbin Engineering, MSc Tsinghua, PhD Alberta - Professor and Director

**Gary Gréval**
BSc Brock, MSc, PhD Guelph - Associate Professor

**Hassan Khan**
BSc NUST, MSc Southern California, PhD Waterloo – Assistant Professor - Assistant Professor

**Stefan C. Kremer**
BSc Guelph, PhD Alberta - Associate Professor and Director

**Xining Li**
BSc, MSc Nanjing, PhD Calgary - Professor

**Xiaodong Lin**
BASc Nanjing, MSc East China Normal, PhD Beijing, PhD Waterloo - Associate Professor

**Pascal Matsakis**
BSc, MSc, PhD Paul Sabatier (France) - Professor

**Judith R. McCuaig**
BEd, BSc, MS, PhD Saskatchewan - Associate Professor

**Blair Nonnecke**
BSc, MSc Guelph, PhD South Bank - Associate Professor

**Charlie F. Ohimbo**
MSc Kiev, PhD New Brunswick - Associate Professor

### Admission Requirements

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/](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.

The 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.

### Program 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 must 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 their 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 their 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.

Collaborative Specializations

Artificial Intelligence
The School of Computer Science participates in the collaborative specialization in Artificial Intelligence. MSc students wishing to undertake thesis research with an emphasis on artificial intelligence are eligible to apply to register concurrently in Computer Science and the collaborative specialization. Students should consult the Artificial Intelligence listing for more information.

One Health
The School of Computer Science participates in the collaborative specialization in One Health. Master’s and Doctoral students wishing to undertake thesis research or their major research paper/project with an emphasis on one health are eligible to apply to register concurrently in Computer Science and the collaborative specialization. Students should consult the One Health listing for more information.

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]
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

Advanced Courses

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

CIS*6050 Neural Networks U [0.50]
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, reargetable 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

IX. Graduate Programs, Computer Science

CIS*6000 Distributed Systems U [0.50]
CIS*6020 Artificial Intelligence U [0.50]
CIS*6030 Information Systems U [0.50]
CIS*6070 Discrete Optimization U [0.50]
CIS*6320 Image Processing Algorithms and Applications U [0.50]
CIS*6420 Soft Computing U [0.50]
CIS*6890 Technical Communication and Research Methodology U [0.50]
CIS*6050 Neural Networks U [0.50]
CIS*6060 Bioinformatics U [0.50]
CIS*6080 Genetic Algorithms U [0.50]
CIS*6090 Hardware/Software Co-design of Embedded Systems U [0.50]
CIS*6100 Parallel Processing Architectures U [0.50]
CIS*6120 Uncertainty Reasoning in Knowledge Representation U [0.50]
CIS*6130 Object-Oriented Modeling, Design and Programming U [0.50]
CIS*6140 Software Engineering U [0.50]
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIS*6160</td>
<td>Multiagent Systems U [0.50]</td>
<td>0.50</td>
<td>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.</td>
</tr>
<tr>
<td>Department(s):</td>
<td>School of Computer Science</td>
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<tr>
<td>CIS*6200</td>
<td>Design Automation in Digital Systems U [0.50]</td>
<td>0.50</td>
<td>Techniques and software tools for design of digital systems. Material covered includes high-level synthesis, design for testability, and FPGAs in design and prototyping.</td>
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<tr>
<td>Department(s):</td>
<td>School of Computer Science</td>
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<tr>
<td>CIS*6490</td>
<td>Analysis and Design of Computer Algorithms U [0.25]</td>
<td>0.25</td>
<td>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.</td>
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<tr>
<td>Department(s):</td>
<td>School of Computer Science</td>
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<tr>
<td>CIS*6650</td>
<td>Topics in Computer Science I U [0.50]</td>
<td>0.50</td>
<td>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.</td>
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<td>Department(s):</td>
<td>School of Computer Science</td>
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<tr>
<td>CIS*6660</td>
<td>Topics in Computer Science II U [0.50]</td>
<td>0.50</td>
<td>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.</td>
</tr>
<tr>
<td>Restriction(s):</td>
<td>Instructor consent required</td>
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<tr>
<td>Department(s):</td>
<td>School of Computer Science</td>
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IX. Graduate Programs, Creative Writing

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.

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.

Program 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.

Procedures

Candidates should be aware of the deadlines schedule, a copy of which may be obtained in the Office of Graduate and Postdoctoral Studies. Please note, the Creative Writing MFA program has also implemented internal expectations/deadlines that must be adhered to by the candidate; these internal expectations/deadlines are distributed by the Graduate Program Coordinator.

Following the master's examination, the candidate, if successful, will submit the creative thesis to the Atrium; it will be retained permanently by the university.

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.

Master's Examination

The Creative Writing MFA Examination Committee normally consists of three members appointed by the Department Chair:

- a member of the regular graduate faculty of the school or retired faculty with Associated Graduate Faculty status who is not a member of the Advisory Committee, and who acts as chair of the master's Examination Committee and to make arrangements therefor;
- a member of the candidate's Advisory Committee (normally, the Advisor);
- a member of the graduate faculty who may be a member of the Advisory Committee (normally, the second reader).

Note

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.

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Master's Examination

The Creative Writing MFA Examination Committee normally consists of three members appointed by the Department Chair:

- a member of the regular graduate faculty of the school or retired faculty with Associated Graduate Faculty status who is not a member of the Advisory Committee, and who acts as chair of the master's Examination Committee and to make arrangements therefor;
- a member of the candidate's Advisory Committee (normally, the Advisor);
- a member of the graduate faculty who may be a member of the Advisory Committee (normally, the second reader).
Copies of the Creative Thesis

One electronic (.pdf) copy of the certified creative thesis must be submitted to the Atrium by the thesis submission deadline date shown in the Academic Schedule in the calendar. Also included in the electronic submission must be a brief abstract consisting of no more than 150 words. The Certificate of Approval signed by the Examination Committee, a copy of the circulation waiver, and the copying license must also be submitted to the Office of Graduate and Postdoctoral Studies. Departments may have a requirement to submit a bound copy of the thesis.

School Regulations

The school may have specified regulations in addition to those described in this calendar. The student is responsible for consulting the school concerning any such regulation. University regulations, as specified herein, take precedence and may not be overruled by any school regulation.

Courses

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

**CRWR*6100 Poetry Workshop E-W [0.50]**

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.

*Restriction(s):* MFA.CW students only  
*Department(s):* School of English and Theatre Studies

**CRWR*6600 Plenary Course: Writers on Writing F [0.50]**

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 literary aesthetic and to develop professional skills.

*Restriction(s):* MFA.CW students only  
*Department(s):* School of English and Theatre Studies

**CRWR*6600 Plenary Course: Writers on Writing F [0.50]**

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*Restriction(s):* MFA.CW students only  
*Department(s):* School of English and Theatre Studies

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*Restriction(s):* MFA.CW students only  
*Department(s):* School of English and Theatre Studies

**CRWR*6200 Fiction Workshop F-W [0.50]**

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.

*Restriction(s):* MFA.CW students only  
*Department(s):* School of English and Theatre Studies

**CRWR*6200 Writing the Decolonial-Fiction U [0.50]**

This course teaches writers to approach writing as a conscious engagement with social and political worlds. Students will pay close critical attention to questions of Decolonial thought and race as they are expressed in the structure, narrative arc, character, voice and geographies of writing.

*Offering(s):* Annually  
*Restriction(s):* MFA.CW students only  
*Department(s):* School of English and Theatre Studies

**CRWR*6240 Hybrid Forms and Mixed-Mode Narratives U [0.50]**

This course focuses on narrative that experiments with generic boundaries and received forms. Students will examine the use of multiple narrative lines and blended modes (poetry, fiction, nonfiction, graphic narrative) to deepen meaning and amplify personal-social intersections, including with the natural world.

*Offering(s):* Alternate Years  
*Restriction(s):* MFA.CW students only  
*Department(s):* 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.

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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.

Program Requirements

Students enrol in one of three study options: 1) course work 2) major research paper or 2) thesis. These options are detailed below.

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

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
- CCJP*6100 [0.50] Governing Criminal Justice
- CCJP*6200 [0.25] Professional Seminar in CCJP

Elective Courses

The core courses are:
- 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

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.

Courses

For courses without a semester designation the student should consult the Graduate Program Coordinator.

Core Courses

| CCJP*6000 | Courts | 0.50 |
| CCJP*6100 | Governing Criminal Justice | 0.50 |
| CCJP*6200 | Professional Seminar in CCJP | 0.25 |
| CCJP*6300 | Research Methods in Criminal Justice | 0.75 |
| SOC*6350 | Society, Crime and Control | 0.50 |

One elective from the list found in the Courses section below and the MRP completed under the supervision of a faculty supervisor:

| CCJP*6660 | Major Research Paper | 1.00 |

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.

Restriction(s): Restricted to CCJP graduate students

Department(s): Department of Sociology and Anthropology, Department of Political Science

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.

Program Requirements

Students enrol in one of three study options: 1) course work 2) major research paper or 2) thesis. These options are detailed below.

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

Elective Courses

The core courses are:
- 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
Critical Studies in Improvisation

The MA & PhD programs in Critical Studies in Improvisation investigate the dynamic relationships between improvised creative practices and broader social relations in the Arts, Humanities, and Social Sciences. Coordinated by the International Institute for Critical Studies in Improvisation at the University of Guelph, the programs offer a collaborative intellectual environment where scholars in the field of improvisation studies activate new social and creative configurations of power, new strategies for facilitating social justice, and new tactics to interpret and address the ever-changing world around us. Crucially, this work is enacted through students’ critical, practical, rigorous investigation of the processes and impacts of improvised creative practices.

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Rebecca Caines
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Eric Lewis
Philosophy, McGill University

George Lipsitz
Black Studies, University of California, Santa Barbara

Kevin McNeil
English, University of British Columbia

Ellen Waterman
Music, Memorial University Newfoundland

MA Program

The MA program draws on faculty expertise at the University of Guelph, as we all five partner sites across Canada and the USA (UBC, Regina, McGill, Memorial, and University of California, Santa Barbara), and focuses on developing broad-level skills (e.g., collaboration across multiple institutions/organizations and disciplines; internships/community placements; partnership development opportunities; intercultural engagement) with an eye to forming and deploying the skills that lead to both academic and non-academic employment.

The interdisciplinary curriculum will build competencies in research and practice across the following areas: the critical historicisation of improvised art and practice; research methods and core concepts in Critical Studies in Improvisation; the development of ethical frameworks for collaborative, community-engaged initiatives; and the development and implementation of practice-based research projects.

Admission Requirements

Applicants to the MA must hold a four-year Honours Bachelor’s degree or equivalent with a minimum GPA of 75%, in a field related to their proposed study. Applicants must provide two letters of reference and will be required to submit a portfolio with a representative sampling of their best and most relevant creative, professional, and/or research practice, in relationship to the field of Critical Studies and Improvisation and to their proposed area of research. Applicants will submit a 2-page research proposal outlining their critical orientation and proposed research activity for the program of study.

Program Requirements

Students must complete 3.5 credits: IMPR*6010 (1.0 credit), IMPR*6020 (1.0 credit), IMPR*6030 (0.5 credit), one elective (0.5 credit), and the Major Research Paper IMPR*6800 (0.5 credit).

YEAR 1

Semester 1
IMPR*6010 [1.00] Core Concepts in Critical Studies in Improvisation
IMPR*6030 [0.50] Foundational Research Methods in Critical Studies in Improvisation
Optional Elective, Directed Reading or Internship

Semester 2
IMPR*6010 [1.00] Core Concepts in Critical Studies in Improvisation
Optional Elective, Directed Reading or Internship

Semester 3
Optional Elective, Directed Reading or Internship
Presentation at Graduate Colloquium

YEAR 2

Semester 1
IMPR*6020 [1.00] Arts-Based Community Making
Optional Elective, Directed Reading or Internship

Semester 2
IMPR*6020 [1.00] Arts-Based Community Making
Optional Elective, Directed Reading or Internship
Students may transfer to the PhD program or continue MA

Semester 3
IMPR*6800 [0.50] Major Research Project in Critical Studies in Improvisation
Optional Elective, Directed Reading or Internship
Presentation at Graduate Colloquium

PhD Program

The PhD program draws on faculty expertise at the University of Guelph, as we all five partner sites across Canada and the USA (UBC, Regina, McGill, Memorial, and University of California, Santa Barbara), and focuses on developing broad-level skills (e.g., collaboration across multiple institutions/organizations and disciplines; internships/community placements; partnership development opportunities; intercultural engagement) with an eye to forming and deploying the skills that lead to both academic and non-academic employment.

The interdisciplinary curriculum will enhance competencies in research, practice, and teaching across the following areas: the critical historicisation of improvised art and practice; research methods and core concepts in Critical Studies in Improvisation; the development of ethical frameworks for collaborative, community-engaged initiatives; and the development and implementation of practice-based research projects. Students are required to successfully complete two qualifying examinations and a research proposal before producing and orally defending a dissertation reflecting original research on a topic that has been approved by the advisory committee.
Admission Requirements
Applicants must have achieved a grade average of at least 75% (B) in the Master’s degree program. Under exceptional circumstances admission directly to a PhD program with an appropriate Honours degree alone may be granted. Applicants must provide two letters of reference and will be required to submit a portfolio with a representative sampling of their best and most relevant creative, professional, and/or research practice, in relationship to the field of CSI and to their proposed area of research. Applicants will submit a 3 page research proposal outlining their critical orientation and proposed research activity for the program of study.

Program Requirements
Students must complete 3.0 credits: IMPR*6010 (1.0 credit), IMPR*6020 (1.0 credit), IMPR*6030 (0.5 credit), IMPR*6410 (0.5 credit), and successfully defend their thesis project.

YEAR 1
Semester 1
IMPR*6010 [1.00] Core Concepts in Critical Studies in Improvisation
IMPR*6030 [0.50] Foundational Research Methods in Critical Studies in Improvisation
Semester 2
IMPR*6010 [1.00] Core Concepts in Critical Studies in Improvisation
IMPR*6410 [0.50] Pedagogy Lab
Semester 3
Qualifying Exam Preparation: Secondary Area

YEAR 2
Semester 1
IMPR*6020 [1.00] Arts-Based Community Making
Qualifying Exam Preparation: Primary Area
Semester 2
IMPR*6020 [1.00] Arts-Based Community Making
Qualifying Examination Presentation
Semester 3
Optional Practicum
Presentation at Graduate Colloquium

YEAR 3
Semester 1
Optional Elective, Directed Reading or Internship
Research/Writing
Semester 2
Optional Elective, Directed Reading or Internship
Research/Writing
Semester 3
Research/Writing

YEAR 4
Semester 1
Research/Writing
Semester 2
Research/Writing
Semester 3
Research/Writing
Thesis Defence

Courses

IMPR*6010 Core Concepts in Critical Studies in Improvisation F-W [1.00]
This required two-term course is based on seminal works that introduce the field of critical studies in improvisation. It is designed to expose students to core concepts and key readings in critical studies in improvisation, with especial attention to the historical, theoretical, and critical literature in the field.
Department(s): School of English and Theatre Studies

IMPR*6020 Arts-Based Community Making F-W [1.00]
This required two-term course emphasizes the links between improvisation and social practices, and the connections between principles of improvised artistic practices and those of ethical community-engaged collaboration.
Department(s): School of English and Theatre Studies

IMPR*6030 Foundational Research Methods in Critical Studies in Improvisation F [0.50]
This required course provides an overview of a range of research methodologies pertinent to the field of Critical Studies in Improvisation. These include: critical thinking and writing strategies; discursive and qualitative research practices; community literacy and outreach; research ethics; grant-writing and research funding practices and possibilities; practicum-based learning issues and contexts; and knowledge mobilization strategies.
Department(s): School of English and Theatre Studies

IMPR*6410 Pedagogy Lab W [0.50]
This practicum experience, required for PhD students, is a closely mentored opportunity to develop the pedagogical skills and mindsets necessary to support learner-centered, improvisation-based, teaching and course design.
Department(s): School of English and Theatre Studies

IMPR*6800 Major Research Project in Critical Studies in Improvisation F,W [0.50]
An independent study course, the content of which is agreed upon between the individual MA student and their supervisor. The student will conduct an extended research project that provides them with training in research methodology, culminating in a major project or paper. Subject to the approval of the student’s advisory committee and the Graduate Program Committee.
Prerequisite(s): IMPR*6010, IMPR*6020, IMPR*6030
Department(s): School of English and Theatre Studies
Cybersecurity and Threat Intelligence

The Master of Cybersecurity and Threat Intelligence (MCTI) is offered by the School of Computer Science. This professionally oriented 12-month masters is unique in its core focus on threat intelligence, Security Incident and Event Management (SIEM), intrusion prevention, malware analysis, penetration testing, and computer forensics, and in its integration of experiential lab-based learning. It covers the most challenging and technical aspects of the cybersecurity field and ensures that graduates are equipped with the professional capabilities to respond ethically and with a global social awareness of the implications of their work. Students gain hands-on experience with real and simulated security attacks such that graduates are primed to help organizations create security frameworks, protect sensitive data from threats, and analyse violations to help prevent future breaches.

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Pascal Matsakis
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Hasan Khan
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Denis Nikitenko
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MCTI Program

The Master of Cybersecurity and Threat Intelligence is a terminal masters degree focused on training individuals to become technically skilled and ethically-minded cybersecurity professionals. Students develop mastery in security analysis and design, security architecture, threat intelligence, digital forensics, and penetration testing. Hands-on training in the cybersecurity teaching lab, the Security Operations Centre, enables students to work with real and simulated security attacks independently and collaboratively. The program culminates in an independent project wherein students partner with an industry or academic partner to produce an evidence-based solution to a complex cybersecurity problem.

Admission Requirements

Admission to the Master of Cybersecurity and Threat Intelligence program may be granted on the School of Computer Science’s recommendation to:

i. Applicants who have successfully completed an undergraduate degree/baccalaureate in an honours program or the equivalent (having achieved a grade average of at least 75%, B in the last four semesters of study) in computer science, computer engineering, or a related subject area (or hold a minor in one of these areas) from a recognized university; and

ii. Applicants who have relevant experience or background knowledge of Data Communication and Networking (such as a course equivalent to CIS*3210 Computer Networks) and Computer Programming (such as a course equivalent to CIS*2500 Intermediate Programming).

Successful applicants must also meet the University of Guelph’s English Proficiency requirements for admission. If an applicant’s first language is not English, an English Language Proficiency test will be required during the application phase.

All applications will be reviewed by the cybersecurity admissions committee. Students are admitted for a September start date. The School of Computer Science office should be consulted for admission deadlines.

Program Requirements

Students in the Master of Cybersecurity and Threat Intelligence program are required to complete a minimum of 4.00 graduate credits, including the following required courses:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIS*6510</td>
<td>Cybersecurity and Defense in Depth</td>
<td>0.50</td>
</tr>
<tr>
<td>CIS*6520</td>
<td>Advanced Digital Forensics and Incident Response</td>
<td>0.50</td>
</tr>
<tr>
<td>CIS*6530</td>
<td>Cyber Threat Intelligence and Adversarial Risk Analysis</td>
<td>0.50</td>
</tr>
<tr>
<td>CIS*6540</td>
<td>Advanced Penetration Testing and Exploit Development</td>
<td>0.50</td>
</tr>
<tr>
<td>CIS*6550</td>
<td>Privacy, Compliance, and Human Aspects of Cybersecurity</td>
<td>0.50</td>
</tr>
<tr>
<td>CIS*6560</td>
<td>Cybersecurity and Threat Intelligence Project</td>
<td>1.00</td>
</tr>
</tbody>
</table>

Students can select from the following list of electives to fulfill the remaining 0.50 graduate credit:

<table>
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<tbody>
<tr>
<td>CIS*6570</td>
<td>Advanced Cryptography and Cryptanalysis</td>
</tr>
<tr>
<td>CIS*6580</td>
<td>Security Monitoring and Cyber Threat Hunting</td>
</tr>
</tbody>
</table>

Students may also take up to one graduate level course in the related areas of Artificial Intelligence or Data Science to fulfill their elective requirement.

Courses

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>CIS*6510</td>
<td>Cybersecurity and Defense in Depth</td>
<td>F [0.50]</td>
</tr>
<tr>
<td>CIS*6520</td>
<td>Advanced Digital Forensics and Incident Response</td>
<td>F [0.50]</td>
</tr>
<tr>
<td>CIS*6530</td>
<td>Cyber Threat Intelligence and Adversarial Risk Analysis</td>
<td>F [0.50]</td>
</tr>
<tr>
<td>CIS*6540</td>
<td>Advanced Penetration Testing and Exploit Development</td>
<td>F [0.50]</td>
</tr>
<tr>
<td>CIS*6550</td>
<td>Privacy, Compliance, and Human Aspects of Cybersecurity</td>
<td>F [0.50]</td>
</tr>
<tr>
<td>CIS*6560</td>
<td>Cybersecurity and Threat Intelligence Project</td>
<td>F [1.00]</td>
</tr>
</tbody>
</table>

This course provides an overview of concepts and technical measures that are employed to enforce security policies and protect networks and systems from malicious activities. Students will learn how to engineer a secure system and how to secure networks in an ethical manner.

Restriction(s): Student registered in the MCTI program.
Department(s): School of Computer Science

<table>
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<tbody>
<tr>
<td>CIS*6570</td>
<td>Advanced Cryptography and Cryptanalysis</td>
<td>F [0.50]</td>
</tr>
<tr>
<td>CIS*6580</td>
<td>Security Monitoring and Cyber Threat Hunting</td>
<td>F [0.50]</td>
</tr>
</tbody>
</table>

This course provides an in-depth understanding of theoretical concepts and practical issues in the field of digital forensics and incident response. Students will develop necessary skills, methodologies, and processes to detect cyber incidents and conduct in-depth computer and network investigation.

Restriction(s): Student registered in the MCTI program.
Department(s): School of Computer Science

<table>
<thead>
<tr>
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<th>Title</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIS*6530</td>
<td>Cyber Threat Intelligence and Adversarial Risk Analysis</td>
<td>F [0.50]</td>
</tr>
</tbody>
</table>

This course provides an in-depth understanding of techniques for detecting, responding to, and defeating Advanced Persistent Threats (APT) and malware campaigns using artificial intelligence and data mining techniques. Students will identify, extract, and leverage intelligence from different types of cyber threat actors.

Restriction(s): Student registered in the MCTI program.
Department(s): School of Computer Science
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Description</th>
</tr>
</thead>
</table>
| CIS*6540    | Advanced Penetration Testing and Exploit Development W [0.50]                 |         | This course provides an in-depth understanding of techniques for detecting, responding to, and defeating Advanced Persistent Threats (APT) and malware campaigns using artificial intelligence and data mining techniques. Students will identify, extract, and leverage intelligence from different types of cyber threat actors.  
|             | Restriction(s):                                                              |         | Student registered in the MCTI program.                                                                                                                                                                    |
|             | Department(s):                                                               |         | School of Computer Science                                                                                                                                                                                 |
| CIS*6550    | Privacy, Compliance, and Human Aspects of Cybersecurity U [0.50]              |         | This course provides an in-depth view of the privacy, regulatory, and ethical issues surrounding cybersecurity. It covers methods of mitigating/treating privacy risks associated with emerging technologies that collect, manage, and analyse data. This course also examines data protection regulations and compliance strategies.  
|             | Department(s):                                                               |         | School of Computer Science                                                                                                                                                                                 |
| CIS*6560    | Cybersecurity and Threat Intelligence Project W-S [1.00]                      |         | Students plan, develop, and write an industry- or faculty-led report and produce required tools, services, and software. Projects should advance knowledge or practice, and address an emerging challenge in cybersecurity, cyber threat intelligence, digital forensics and incident response, cyber threat hunting, or a closely related field.  
|             | Restriction(s):                                                              |         | Student registered in the MCTI program.                                                                                                                                                                    |
|             | Department(s):                                                               |         | School of Computer Science                                                                                                                                                                                 |
| CIS*6570    | Advanced Cryptography and Cryptanalysis U [0.50]                             |         | This course provides an in-depth understanding of modern cryptography, with emphasis on practical applications. Topics covered include classical systems, information theory, symmetrical cryptosystems, block ciphers, stream ciphers, DES, AES, asymmetric cryptosystems, ECC, provable security, key exchange and management, and authentication and digital signatures, among others.  
|             | Department(s):                                                               |         | School of Computer Science                                                                                                                                                                                 |
| CIS*6580    | Security Monitoring and Cyber Threat Hunting U [0.50]                         |         | This course provides a comprehensive review of tools, techniques, and procedures for monitoring network events and assets to build a secure network architecture. It trains students in methods for hunting attackers that could bypass designed network defense mechanisms in an enterprise.  
|             | Restriction(s):                                                              |         | Student registered in the MCTI program.                                                                                                                                                                    |
|             | Department(s):                                                               |         | School of Computer 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

Chair
Stephen Kosempel (725 MacKinnon, Ext. 56339)
kosempel@uoguelph.ca

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Rene Kirkegaard (707 MacKinnon, Ext. 53551)
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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 Cadby
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 Genic
BS, MA Bogazici, MA, Ms, PhD Arizona - Professor

Johanna Goertz
BSc Bonn, MA, PhD Ohio State - Associate Professor

Nikola Gradjojevic
BSc, MSc Eng Novi Sad, MA Essex and CEU, PhD British Columbia - Professor

Louise A. Grogan
BSc London School of Economics, MA Catholique de Louvain, PhD Amsterdam - 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 - Professor

Stephen Kosempel
BA Queen’s, MA Victoria, PhD Simon Fraser - Associate Professor and Chair

Delong Li
BA, BS Tsinghua, MA, Peking, MA, PhD John Hopkins - Assistant Professor

Mei Li
BA, MA Wuhan, MA, PhD Queen's - Associate Professor

Patrick Martin
BA California (Irvine), MA Cornell, PhD Guelph - Assistant Professor

Alex Maynard
BA Cornell, MA, MPhil, PhD Yale - Professor

Ross McKenzie
BA Queen's, MA, PhD British Columbia - Professor

Miana Plesca
BSc Technical University of Cluj (Romania); MA Georgetown (Washington, D.C.); PhD Western Ontario - Associate Professor

Asha Sadanand
BSc, MA Alberta, PhD California Institute of Technology - Professor

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 - Professor

Francis Tapon
DES Paris, MBA Columbia, MA, PhD Duke - Professor

Henry Thille
BComm Saskatchewan, MA, PhD British Columbia - Associate Professor

Ilias Tsiafas
BA Toronto, MA York, PhD Toronto - 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. Applications 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.

Program 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 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
   - ECON*6180 [0.50] Econometric Methods

2. Three additional courses (1.5 credits)

3. ECON*6940 [1.00] Research Project

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
   - 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 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
   - 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

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
   - ECON*6180 [0.50] Econometric Methods

2. The Finance Core (1.5 credits)
   - ECON*6380 [0.50] Financial Economics

2019-2020 Graduate Calendar

January 28, 2020
Courses

**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 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 students 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

**ECON*6500 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
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>ECON*6140</td>
<td>Econometrics I U</td>
<td>0.50</td>
<td>Topics include a review of the classical linear regression model, applications of generalized</td>
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<td>least squares, maximum likelihood methods and various statistical test procedures.</td>
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<td><strong>Department(s):</strong> Department of Economics and Finance</td>
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<tr>
<td>ECON*6160</td>
<td>Econometrics II U</td>
<td>0.50</td>
<td>Topics include maximum likelihood as a method of estimation and inference, nonlinear</td>
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<td>estimation and simultaneous equations. Also more specialized topics such as limited-dependent-variable models and non-parametric regression methods may be covered.</td>
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<td><strong>Department(s):</strong> Department of Economics and Finance</td>
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<tr>
<td>ECON*6170</td>
<td>Topics in Econometrics U</td>
<td>0.50</td>
<td>This is an advanced econometrics topics course that covers the area of non-parametric and</td>
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<td>semiparametric estimation and testing of econometrics models, including time series and panel</td>
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<td>data semiparametric models. <strong>Department(s):</strong> Department of Economics and Finance</td>
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<tr>
<td>ECON*6180</td>
<td>Econometric Methods U</td>
<td>0.50</td>
<td>This course follows ECON*6050. It covers estimation by instrumental variables, estimations of</td>
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<td>simultaneous systems, asymptotic distribution theory, maximum likelihood estimation, binary</td>
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<td>choice and limited dependent variable models, and issues in time series analysis. <strong>Department(s):</strong> Department of Economics and Finance</td>
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<tr>
<td>ECON*6200</td>
<td>Economic History U</td>
<td>0.50</td>
<td>This course considers topics in economic history which vary from year to year. The emphasis</td>
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<td>will be usually on late-19th or 20th century topics and often involves a world emphasis. Student</td>
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<td>presentations and papers form a large part of the course. <strong>Department(s):</strong> Department of</td>
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<td>Economics and Finance</td>
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<tr>
<td>ECON*6370</td>
<td>Economic Development in Historical Perspective U</td>
<td>0.50</td>
<td>This course will examine the experience of economic development focusing on the emergence of the</td>
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<td>Third World. Topics for discussion will vary from year to year; they may include the impact of</td>
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<td>trade expansion during the eighteenth and nineteenth centuries, the role of manufacturing as a</td>
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<td>leading sector, statis vs. the new classical approaches to government policy, and others.</td>
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<td><strong>Department(s):</strong> Department of Economics and Finance</td>
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<tr>
<td>ECON*6320</td>
<td>International Finance U</td>
<td>0.50</td>
<td>This course deals with the theoretical policy and issues of international finance. Topics</td>
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<td>may include exchange rate determination, capital flows in international markets, the financing</td>
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<td>of trade flows, and open economy macroeconomic models and policy issues. <strong>Department(s):</strong></td>
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<td>Department of Economics and Finance</td>
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<tr>
<td>ECON*6380</td>
<td>Financial Economics U</td>
<td>0.50</td>
<td>This course has three objectives: (i) build a common background for all students in asset</td>
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<td>pricing and corporate finance in order to facilitate discussion of finance research; (ii)</td>
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<td>provide an in-depth look at selected finance topics, and (iii) expose students to top published</td>
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<td>research papers. <strong>Department(s):</strong> Department of Economics and Finance</td>
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<tr>
<td>ECON*6390</td>
<td>Empirical Finance and Financial Econometrics U</td>
<td>0.50</td>
<td>This course covers topics in empirical finance, involving the integration of financial theory,</td>
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<td>financial econometrics, and data analysis. Students will learn how empirical research in finance</td>
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<td>is conducted through reading involving both textbooks and journal articles and from conducting</td>
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<td>an independent research project. <strong>Department(s):</strong> Department of Economics and Finance</td>
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<td>ECON*6490</td>
<td>Money and Banking U</td>
<td>0.50</td>
<td>This course studies monetary economies using overlapping generations models, MIU models and CIA</td>
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<td>models. More specifically, we will study major issues in money and banking, such as the role of</td>
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<td>money and banks, the cost of inflation, and the optimal monetary policies.</td>
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<tr>
<td>ECON*6820</td>
<td>Security Analysis and Portfolio Management U</td>
<td>0.50</td>
<td>This course has three goals: 1. to teach students how to analyze companies in the context of</td>
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<td>constructing equity portfolios. 2. to help students understand the valuation process of firms</td>
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<td>and calculate companies intrinsic value. 3. to make students aware of the role and activities of</td>
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<td>equity security analysts in highly competitive markets. <strong>Department(s):</strong> Department of</td>
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<td>Economics and Finance</td>
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<td>ECON*6350</td>
<td>Economic Development U</td>
<td>0.50</td>
<td>This course examines economic development from an international perspective: theories, history,</td>
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<td>policies and prospects. <strong>Department(s):</strong> Department of Economics and Finance</td>
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<td>ECON*6600</td>
<td>Labour Economics U</td>
<td>0.50</td>
<td>Major themes in labour market theory including static and dynamic labour demand and supply,</td>
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<td>migration and wage structures and dynamics, unemployment, migration and the role of social</td>
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<td>programs. <strong>Department(s):</strong> Department of Economics and Finance</td>
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<td>ECON*6610</td>
<td>Topics in Labour Economics U</td>
<td>0.50</td>
<td>This course complements ECON*6600. Topics include advanced issues in family labour supply,</td>
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<td>human capital, wage bargaining and contract theory, search theory, duration analysis and its application to major labour market spells such as employment and unemployment. <strong>Department(s):</strong> Department of Economics and Finance</td>
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<tr>
<td>ECON*6820</td>
<td>Environmental and Resource Economics U</td>
<td>0.50</td>
<td>This course considers topics in environmental and resource economics from an international</td>
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<td>perspective and from a Structure-Conduct-Performance perspective. Typical topics may include</td>
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<td>oligopoly theory, determinants of industrial structure, Cause theorem, market entry, advertising,</td>
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<td>research and development, product differentiation, and price discrimination. <strong>Department(s):</strong></td>
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<td>Department of Economics and Finance</td>
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<td>ECON*6300</td>
<td>International Trade Theory U</td>
<td>0.50</td>
<td>This course provides a rigorous treatment of both positive and normative aspects of trade</td>
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<td>theory through extensive use of general equilibrium models under varying assumptions. Topics</td>
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<td>may also include barriers to trade, international factor movements, growth and development, and</td>
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<td>strategic trade policy. <strong>Department(s):</strong> Department of Economics and Finance</td>
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<td>ECON*6400</td>
<td>Public Finance U</td>
<td>0.50</td>
<td>This course surveys the normative theory of the public sector. Topics may include public</td>
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<td>expenditure theory, tax theory, cost benefit analysis and fiscal federalism. <strong>Department(s):</strong></td>
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<td>Department of Economics and Finance</td>
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<tr>
<td>ECON*6500</td>
<td>Economics of Social Welfare U</td>
<td>0.50</td>
<td>This course deals with the analysis of social welfare programs, concentrating on national</td>
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<td>health insurance. It covers their structure, incentives and distribution effects, and includes</td>
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<td>empirical analysis of existing programs. <strong>Department(s):</strong> Department of Economics and Finance</td>
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<tr>
<td>ECON*6700</td>
<td>Industrial and Market Organization U</td>
<td>0.50</td>
<td>The major topics of industrial organization are analyzed from both a game theoretic perspective and from a Structure-Conduct-Performance perspective. 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. <strong>Department(s):</strong> Department of Economics and Finance</td>
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<tr>
<td>ECON*6750</td>
<td>Managerial Economics U</td>
<td>0.50</td>
<td>This course introduces students to the latest developments in the economic analysis of the</td>
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<td>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. <strong>Department(s):</strong> Department of Economics and Finance</td>
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<tr>
<td>ECON*6770</td>
<td>Financial Management U</td>
<td>0.50</td>
<td>This course examines the implications of financing decisions made by firms in a world of</td>
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<td>uncertainty. Topics such as capital budgeting, capital structure, dividend policy, market</td>
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<td>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. <strong>Department(s):</strong> Department of Economics and Finance</td>
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<tr>
<td>Course Code</td>
<td>Course Title</td>
<td>Credits</td>
<td>Description</td>
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</table>
| 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 and Postdoctoral 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 MASc and PhD levels. All programs are offered as full- or part-time studies. These programs provide for specialization in six fields of study: 1) Biological Engineering 2) Computer Engineering 3) Environmental Engineering 4) Engineering Systems and Computing 5) Mechanical Engineering 6) 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.

- **Computer Engineering** is about the design and implementation of computer devices and systems. Driven by the ubiquity of integrated computing systems, Computer Engineering has expanded from a discipline with a few core areas, mainly focused on the design of microchips, to a broad field with widespread ramifications. It involves mapping computing ideas into physical implements and software components. Some active research areas include: integrated circuits and microprocessors, digital systems design and computer architecture, high-performance and configurable computing, telecommunication and cloud-computing networks, operating systems and software engineering.

- **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.

**Graduate Program Assistant - MASc. and PhD.**
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**Graduate Program Assistant - Admissions**
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- **Manick Annamalai**
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- **Shawki Areibi**
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- **Ryan Clemmer**
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- **Brahm Gharabaghi**
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- **Karen D. Gordon**
BSc Guelph, PhD Western Ontario, P.Eng - Associate Professor and Associate Dean (Academic), College of Engineering and Physical Science

- **Stefano Gregori**
Laurea, Doctorate Univ. of Pavia - Associate Professor

- **Marwan Hassan**
BS Helwan Univ., MS Tuskegee Univ., PhD McMaster, P.Eng - Professor

- **Hadis Karimipour**
BSc Ferdow, MSc Shahrood, PhD Alberta - Assistant Professor

- **Jana Levison**
BASC, PhD Queens, EIT - Associate Professor

- **William David Lubitz**

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2019-2020 Graduate Calendar

January 28, 2020
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 honors engineering program with at least a 70% average in the past four full-time semesters or the equivalent. International degree and grade equivalents will be determined by the Office of Graduate and Postdoctoral Studies.
- Bachelor of Science degree or equivalent. At least a 75% average in the work of the last four full-time semesters or the last two complete undergraduate years of an honors 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.

Program Requirements

The prescribed program of study must consist of no fewer than 2.0 credits, of which at least 1.0 must be engineering graduate courses. Of the remaining 1.0 credits, 0.5 credits must be at the graduate level, and the other 0.5 credits may be graduate credits or senior undergraduate engineering credits. 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 honors 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 and Postdoctoral 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

Computer Engineering applicants must have a minimum of three of the following courses or equivalents:
• Circuit Analysis
• Programming
• Digital Systems
• Microelectronics
• Computer Organization
• Telecommunications

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.

Program Requirements
All incoming MEng students will be enrolled in the “Coursework” study option by default. If students wish to complete their degree via “Coursework and MRP,” they are encouraged to contact potential advisors within their first semester of study.

COURSEWORK
Students must complete 4.5 credits according to the following:
1. 9 courses;
2. No more than 1.0 credits from senior undergraduate engineering courses;
3. No more than 1.0 credits from outside engineering; and
4. A minimum of 3.5 credits from engineering (including the Final Project Course).

At least 2.5 credits of coursework must be field-specific (see the MEng section of the School of Engineering website for lists of courses). Remaining credits should be chosen in consultation with the Associate Director, Graduate Studies.

COURSEWORK AND MAJOR RESEARCH PROJECT (MRP)
Students must complete 4.5 credits according to the following:
1. 7 courses and the Final Project Course (1.0);
2. No more than 1.0 credits from senior undergraduate engineering courses;
3. No more than 1.0 credits from outside engineering; and
4. A minimum of 3.5 credits from engineering (including the Final Project Course).

At least 2.5 credits of coursework must be field-specific (see the MEng section of the School of Engineering website for lists of courses). Remaining credits should be chosen in consultation with the Associate Director, Graduate Studies.

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 requires 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.

Program 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 1.0 of the credits must be engineering graduate courses. Of the remaining 1.0 credits, 0.5 credits must be at the graduate level, and the other 0.5 credits may be graduate credits or senior undergraduate engineering credits. Depending on the student's background, the advisory committee may specify more than 2.0 credits, 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.

Graduate Diplomas in Water Resources
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 Systems

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.

Program 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.
Courses

**General**

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<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>ENGG*6000</td>
<td>Advanced Heat and Mass Transfer</td>
<td>0.50</td>
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**Department(s):** School of Engineering

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<th>Course Title</th>
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<tr>
<td>ENGG*6101</td>
<td>Assessment of Engineering Risk</td>
<td>0.50</td>
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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

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<tr>
<td>ENGG*6200</td>
<td>Advanced Fluid Mechanics</td>
<td>0.50</td>
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**Department(s):** School of Engineering

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<tr>
<td>ENGG*6300</td>
<td>Finite Difference Methods</td>
<td>0.50</td>
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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

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<tbody>
<tr>
<td>ENGG*6600</td>
<td>Engineering Systems Modelling and Simulation</td>
<td>0.50</td>
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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

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<tbody>
<tr>
<td>ENGG*6910</td>
<td>Engineering Seminar</td>
<td>0.00</td>
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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

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<tr>
<td>ENGG*6990</td>
<td>Special Topics in Engineering</td>
<td>0.50</td>
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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

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<tr>
<td>ENGG*6260</td>
<td>Colloids, Interfaces and Emulsions</td>
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This course focuses on the theory and the applications of colloid and interface science in the environmental, chemical, and food sectors. Major topics include the forces of interactions between colloids, the stabilization and destabilization of emulsions and foams, and polymeric fluids and gels.

**Prerequisite(s):** CHEM*1040 or equivalent, CHEM*1050 or equivalent

**Department(s):** School of Engineering

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<tr>
<td>ENGG*6610</td>
<td>Food and Bio-Process Engineering</td>
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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

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<tr>
<td>ENGG*6620</td>
<td>Fermentation Engineering</td>
<td>0.50</td>
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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

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**Engineering Design of Sustainable Water Resource Systems**

The courses consist of a total of 2.0 credits. Two courses (1.0 credit) must be selected from the following courses:

- ENGG*6100: [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*6450: [0.50] Risk Assessment and Management
- ENGG*6680: [0.50] Advanced Water and Wastewater Treatment
- ENVS*6820: [0.50] Soil Physics
- RPDE*6310: [0.50] Environmental Impact Assessment
- ENGG*6420: [0.50] Watershed Systems Design
- ENGG*6430: [0.50] Soil-Water Conservation Systems Design
- ENGG*6437: [0.50] Urban Water Systems Design

In addition to the above courses, 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.

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**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.

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**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 department program admission requirements. Students should consult the International Development Studies listing to confirm the IDS collaborative specialization requirements.

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**Artificial Intelligence**

The School of Engineering participates in the collaborative specialization in Artificial Intelligence. MASc students wishing to undertake thesis research with an emphasis on artificial intelligence are eligible to apply to register concurrently in Engineering and the collaborative specialization. Students should consult the Artificial Intelligence listing for more information.

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**One Health**

The School of Engineering participates in the collaborative specialization in One Health. Master’s and Doctoral students wishing to undertake thesis research or their major research project with an emphasis on one health are eligible to apply to register concurrently in Engineering and the collaborative specialization. Students should consult the One Health listing for more information.
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]
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 process food 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

Computer Engineering

ENGG*6450 Queueing Theory & Traffic Modeling in Data Networks U [0.50]
Restriction(s): Engineering graduate students. Instructor consent required.
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

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.
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*6400 Mobile Devices App Development U [0.50]
This course provides an introduction to developing applications for mobile devices. The emphasis will be on the fundamentals of mobile application programming. This is primarily a project-based course in which the goal is to produce a working app by the end of the course. The purpose of this course is to create new inter-disciplinary applications of mobile devices, Graduate students from all disciplines at the University of Guelph are invited to take the course for credit.
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*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*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*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 bioenergy 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
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Description</th>
<th>Department(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGG*6370</td>
<td>Heat Transfer in Porous Media U [0.50]</td>
<td></td>
<td>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)</td>
<td>School of Engineering</td>
</tr>
<tr>
<td>ENGG*6380</td>
<td>Simulation Analysis of Discrete Event Systems U [0.50]</td>
<td></td>
<td>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)</td>
<td>School of Engineering</td>
</tr>
<tr>
<td>ENGG*6390</td>
<td>Final Project in Mechanical Engineering U [1.00]</td>
<td></td>
<td>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.</td>
<td>School of Engineering</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td><strong>Restriction(s):</strong> This course is only open to students registered in the School of Engineering.</td>
<td></td>
</tr>
<tr>
<td>ENGG*6740</td>
<td>Ground Water Modelling U [0.50]</td>
<td></td>
<td>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.</td>
<td>School of Engineering</td>
</tr>
<tr>
<td>ENGG*6800</td>
<td>Deterministic Hydrological Modelling U [0.50]</td>
<td></td>
<td>Deterministic hydrological models. Function of watershed models for hydraulic design, environmental assessment, operation of water control structures, flood warning. Calculation algorithms.</td>
<td>School of Engineering</td>
</tr>
<tr>
<td>ENGG*6820</td>
<td>Measurement of Water Quantity and Quality U [0.50]</td>
<td></td>
<td>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.</td>
<td>School of Engineering</td>
</tr>
<tr>
<td>ENGG*6840</td>
<td>Open Channel Hydraulics U [0.50]</td>
<td></td>
<td>Basic concepts, energy principle; momentum principle; flow resistance; non-uniform flow; channel controls and transitions; unsteady flow; flood routing.</td>
<td>School of Engineering</td>
</tr>
<tr>
<td>ENGG*6860</td>
<td>Stream and Wetland Restoration Design U [0.50]</td>
<td></td>
<td>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.</td>
<td>School of Engineering</td>
</tr>
<tr>
<td>ENGG*6880</td>
<td>Soil Erosion and Fluvial Sedimentation U [0.50]</td>
<td></td>
<td>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.</td>
<td>School of Engineering</td>
</tr>
<tr>
<td>ENGG*6900</td>
<td>Final Project in Water Resources Engineering U [1.00]</td>
<td></td>
<td>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.</td>
<td>School of Engineering</td>
</tr>
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<td></td>
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<td></td>
<td><strong>Restriction(s):</strong> This course is open only to students in the water resources MEng program.</td>
<td></td>
</tr>
<tr>
<td>ENGG*6910</td>
<td>Special Topics in Water Resources Engineering U [0.50]</td>
<td></td>
<td>A course of directed study involving selected readings and analyses in developing knowledge areas of water resources engineering.</td>
<td>School of Engineering</td>
</tr>
</tbody>
</table>
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.

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

Thesis
Students complete four courses (4 x 0.50 credit) plus a thesis of 20,000 to 25,000 words (80-100 pages).

Course Work and Major Research Project (MRP)
Students complete six courses (6 x 0.50 credit) plus ENGL*6803 Research Project.

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 contested nature 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 specific 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, geology, 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

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Jonathan M. Schmidt
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Cynthia D. Scott-Dupree
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Paul K. Sibley
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Laura Van Eerd
MSc, PhD Guelph - Associate Professor

R. Paul Voroney
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Claudia Wagner-Riddle
BSc, MSc Sao Paulo, PhD Guelph - Professor

Jon S. Warland
BSc Cornell, MSc UBC, PhD Guelph - Associate Professor and Acting Director, School of Environmental Sciences

Youbin Zheng
BSc, MSc Southwest Agricultural, MPhil, PhD Newcastle - Associate Professor

Associated Graduate Faculty

Pedro Antunes
BSc Evora, PhD Guelph - Associate Professor, Algoma University

Chris Cutler
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Deena Errampalli
MSc Banaras, MBA, Osmania, PhD Oklahoma - Research Scientist, AAFC, Vineland

Les Evans
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Adam Gillespie
BSc, MSc, PhD Guelph - Assistant Professor

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Simon Lachance
BSc, MSc Laval, PhD Guelph - College Professor, Ridgetown Campus, University of Guelph

Merrin Macrae
BES, MSc York, PhD Wilfrid Laurier - Associate Professor, Geography and Environmental Management, University of Waterloo

Gary Parkin
Retired Faculty, Environmental Sciences, University of Guelph - BSc, MSc Western, PhD Guelph
The 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.

Program 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 two semesters of study to continue in the program. Provisional students will be funded at the same level as regular students.

Program Requirements
The MES thesis 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 MES 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.
One Health

The School of Environmental Sciences participates in the collaborative specialization in One Health. Master’s and Doctoral students wishing to undertake thesis research or their major research paper/project with an emphasis on one health are eligible to apply to register concurrently in Environmental Sciences and the collaborative specialization. Students should consult the One Health listing for more information.

Toxicology

The School of Environmental Sciences participates in the masters/doctoral 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 masters/doctoral collaborative specialization.

Courses

ENVS*6000 Physical Environment of Crops and Forests F [0.50]
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.
Offering(s): Offered in even-numbered years.
Department(s): School of Environmental Sciences

ENVS*6050 Micrometeorology W [0.50]
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.
Offering(s): Offered in even-numbered years.
Department(s): School of Environmental Sciences

ENVS*6060 Meteorological Instrumentation W [0.50]
Theoretical and practical aspects of electronic circuits, sensors, and equipment used in meteorological research.
Prerequisite(s): ENVS*2410 or equivalent
Department(s): School of Environmental Sciences

ENVS*6190 Environmental Microbial Technology U [0.50]
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.
Restriction(s): Undergraduate degree in microbiology or related discipline.
Department(s): School of Environmental Sciences

ENVS*6242 Special Topics in Atmospheric Science F,W,S [0.50]
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.
Restriction(s): Instructor consent required.
Department(s): School of Environmental Sciences

ENVS*6280 Soil Physics W [0.50]
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.
Department(s): School of Environmental Sciences

ENVS*6300 Quantitative Pedology F [0.50]
Pedology considers the morphology, survey, geography, characterization and analysis, development, classification, and interpretation of soil. This course focuses on the quantification of pedology, employing modern digital instrumentation, computational capacity and analytical strategies. Students explore how such multi-scale, spatial-temporal information is used in critical zone modeling.
Prerequisite(s): At least an introductory soil, ecology or physical geography course.
Co-requisite(s): Students with only an introductory level soil course are encouraged to audit ENVS*4390.
Department(s): School of Environmental Sciences

ENVS*6340 Colloquium in Insect Systematics W [0.25]
Weekly discussions and seminars dealing with current topics in systematic entomology.
Offering(s): Offered in odd-numbered years.
Department(s): School of Environmental Sciences

ENVS*6350 Soil Organic Matter and Biochemistry F [0.50]
(1) Soil organic matter characterization, (2) dynamics of soil organic matter, (0.5) nutrient cycling.
Offering(s): Offered in odd-numbered years.
Department(s): School of Environmental Sciences

ENVS*6360 Soil and Water Chemistry W [0.50]
Thermodynamics of soil solutions; solution-solid phase equilibria; reaction kinetics; computer modelling of solute-mineral interactions.
Department(s): School of Environmental Sciences

ENVS*6400 Soil Nitrogen Fertility and Crop Production W [0.50]
Emphasis will be placed on soil N transformations and processes, and N sources for crops; field experimentation methods; environmental issues.
Department(s): School of Environmental Sciences

ENVS*6440 Field Sampling Strategies and Geostatistics W [0.50]
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.
Offering(s): Offered in even-numbered years.
Department(s): School of Environmental Sciences

ENVS*6452 Special Topics in Ecosystem Science and Biodiversity F,W,S [0.50]
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.
Restriction(s): Instructor consent required.
Department(s): School of Environmental Sciences

ENVS*6460 Environmental Remediation W [0.50]
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.
Department(s): School of Environmental Sciences

ENVS*6470 The Science and Management of Multiple Stressors in the Great Lakes F [0.50]
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.
Restriction(s): Instructor consent required.
Department(s): School of Environmental Sciences

ENVS*6500 Environmental Sciences Research Project U [1.00]
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.
Restriction(s): Available only to students registered in the Environmental Sciences: MES program.
Department(s): School of Environmental Sciences

ENVS*6501 Integrating Science and Policy in Environmental Science F [0.50]
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.
Restriction(s): Preference will be given to students in the MES,ENVS,L.
Department(s): School of Environmental Sciences

ENVS*6502 Seminar in Environmental Sciences W [0.50]
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.
Restriction(s): Instructor consent required. Preference will be given to students in the MES program.
Department(s): School of Environmental Sciences

January 28, 2020
ENVS*6503 Biogeochemistry of Wetlands F [0.50]
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.
Restrictions: Preference will be given to students in MES.ENVS:L, MSc.ENVS and PhD.ENVS.
Department(s): School of Environmental Sciences

ENVS*6505 Soil Survey and Interpretation S [0.50]
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.
Restrictions: Preference will be given to students in MES.ENVS:L, MSc.ENVS, PhD.ENVS.
Department(s): 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.
Restrictions: 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.
Restrictions: 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. Offered in conjunction with ENVS*4100. Extra work is required of graduate students.
Offering(s): Offered annually.
Restrictions: 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.
Restrictions: 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.
Restrictions: 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.
Restrictions: Credit may be obtained for only one of ENVS*6740 or ENVS*4370.
Department(s): School of Environmental Sciences

ENVS*6782 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.
Restrictions: 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.
Restrictions: Offered only to MSC.ENVS and PhD.ENVS students.
Department(s): School of Environmental Sciences
Exploring European Identities: The European Studies MA program is designed to provide students with a flexible, interdisciplinary 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

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Padraig O’Cleirigh

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 their 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.

Program 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.

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 Domiticia, 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

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>EURO*6000</td>
<td>Research Methods F [0.50]</td>
<td></td>
<td>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. Department(s): School of Languages and Literatures</td>
</tr>
<tr>
<td>EURO*6010</td>
<td>European Identities W [0.50]</td>
<td></td>
<td>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. Department(s): School of Languages and Literatures</td>
</tr>
<tr>
<td>EURO*6020</td>
<td>Myth, Fairy Tales and European Identities U [0.50]</td>
<td></td>
<td>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). Department(s): School of Languages and Literatures</td>
</tr>
<tr>
<td>EURO*6030</td>
<td>Women and the Arts in Europe: Seeking Expression U [0.50]</td>
<td></td>
<td>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. Department(s): School of Languages and Literatures</td>
</tr>
<tr>
<td>EURO*6040</td>
<td>Europe and the Discourse of Civilization U [0.50]</td>
<td></td>
<td>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. Department(s): School of Languages and Literatures</td>
</tr>
<tr>
<td>EURO*6060</td>
<td>Contemporary Europe U [0.50]</td>
<td></td>
<td>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<em>4050. Extra work is required for graduate students. Restriction(s): Credit may be obtained for only one or EURO</em>6060 or EURO*4050. Department(s): School of Languages and Literatures</td>
</tr>
<tr>
<td>EURO*6070</td>
<td>Topics in Comparative European Culture I U [0.50]</td>
<td></td>
<td>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. Department(s): School of Languages and Literatures</td>
</tr>
<tr>
<td>EURO*6072</td>
<td>Topics in Comparative European Culture II U [0.50]</td>
<td></td>
<td>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</td>
</tr>
<tr>
<td>EURO*6080</td>
<td>Directed Reading Course F,W,S [0.50]</td>
<td></td>
<td>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</td>
</tr>
<tr>
<td>EURO*6100</td>
<td>Research Project U [1.00]</td>
<td></td>
<td>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</td>
</tr>
</tbody>
</table>
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 competency-based program is both a Recognized Education and Training Program with the College of Registered Psychotherapists of Ontario and accredited by the Commission on Accreditation for Marriage and Family Therapy Education of the American Association for Marriage and Family Therapy. The field of study is intensive and focuses on theory, research and clinical practice. 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 program combines high professional practice standards and ethical conduct, with attention to broader social issues that impact couples and families, and places 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 practicum or field placement courses will be required to submit to the agency with which they are placed, personal information about any current 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.

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BASc Guelph, MSc, PhD Manitoba - Assistant Professor

Tricia van Rhijn
BASc, MSc, PhD Guelph - Associate Professor

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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 required by all entering students: 1) a one-semester course in applied statistics (minimum grade of 75%) and 2) a one-semester course in research methods (minimum grade of 75%). MSc AHN students must also have taken prior to beginning the MSc program OR will take during the MSc 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 to human nutrition, human physiology, psychology, communications/counselling, and human development/sociology. 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 an honours degree or equivalent, in a related field. Credit in the following undergraduate courses is required of all entering students: 1) a one-semester course in applied statistics (minimum grade of 75%) and 2) a one-semester course in social-science research methods (minimum grade of 70%). These requirements may be in progress at the time of application. 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 an honours degree or equivalent, in a related field. Credit in the following undergraduate courses is required of all entering students: 1) a one-semester course in applied statistics (minimum grade of 70%) and 2) a one-semester course in social-science research methods (minimum grade of 70%). These requirements may be in progress at the time of application but must be completed by April 30. 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 CFT applicants 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 CFT faculty advisors at that time. Applicants for the thesis stream only must also submit a 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 the 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 half-day interview 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.

Program 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 advisor and advisory committee including:

- FRAN*6000 [0.50] Quantitative Research Methods
- FRAN*6010 [0.50] Applied Statistics
- FRAN*6020 [0.50] Qualitative Research Methods
- FRAN*6550 [0.25] Research Seminar

One additional [0.50] graduate elective course such as FRAN*6610 (Advances in Clinical Nutrition/Assessment I), FRAN*6510 (Nutrition in the Community or another 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] Quantitative Research Methods
- FRAN*6010 [0.50] Applied Statistics
- FRAN*6020 [0.50] Qualitative Research 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, may take FRAN*6530, 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/or supervisors.

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 [1.00] Practicum in Couple and Family Therapy* 
- FRAN*6095 [1.00] 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

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] Quantitative 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 Research Methods

For non-thesis students: One additional course is required:
**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 (minimum grade of 75%) and 2) a one-semester course in research methods (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. 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 (minimum grade of 75%) and 2) a one-semester course in research methods (minimum grade of 75%). A master's thesis is normally required for admission. These requirements may be in progress at the time of application.

**Program Requirements**

**Applied Human Nutrition**

PhD students in Applied Human Nutrition are required to take a minimum of 1.75 graduate credits including FRAN*6550 (0.25) Research Seminar 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*66510 [0.50] Nutrition in the Community

and/or other graduate elective courses, which may be taken within Family Relations and Applied Nutrition or in other academic units of the university.

**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] Quantitative Research Methods
- FRAN*6010 [0.50] Applied Statistics
- FRAN*6020 [0.50] Qualitative Research Methods
- FRAN*6440 [0.50] Applied Factor Analysis & Structural Equation Modelling
- FRAN*6340 [0.50] Interdisciplinary Perspectives in Family Relations and Human Development
- FRAN*66280 [0.50] Theorizing in Family Relations and Human Development
- FRAN*66330 [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.

Students must also complete a research thesis.

**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.

NOTE: 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.
Collaborative Development Studies

International Development Studies

The Department of Family Relations and Applied Nutrition participates in the MSc and PhD collaborative specialization in International Development Studies (IDS). 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. Applications are part of the general MSc or PhD application and applicants apply directly to the Department of Family Relations and Applied Nutrition. In addition to the FRAN MSc or 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 or national development. The IDS designation also requires two core courses in international development theory and research methods. IDS graduates hold positions in government in Canada and abroad with NGOs, international organizations and private consultancies.

Courses

Family Relations and Applied Nutrition

FRAN*6000 Quantitative 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. This course is data-driven and students will learn through hands-on analytic experiences accompanied by in-class lectures and readings.
Restriction(s): Consent required for non-FRAN students.
Department(s): Department of Family Relations and Applied Nutrition

FRAN*6020 Qualitative Research 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*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): Consent required for non-FRAN students.
Department(s): Department of Family Relations and Applied Nutrition

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): 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.
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): For MAN and AHN students only.
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): For MAN and AHN students only.
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 review, 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*6670 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*6620 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.
Department(s): Department of Family Relations and Applied Nutrition

FRAN*6621 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.
Offering(s): Offered in alternate years.
Department(s): Department of Family Relations and Applied Nutrition
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<th>Course Code</th>
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<tr>
<td>FRAN*6221</td>
<td>Evidence-Based Practice and Knowledge Translation U [0.50]</td>
<td>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.</td>
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<td>Offering(s):</td>
<td>Offered in alternate years.</td>
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| 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. | 
| Offering(s): | Offered in alternate years. | 
| Restriction(s): | Available to FRAN 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] | 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*6310 Family Relationships Across the Life Span 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 | 

**Note**

The following courses are taken primarily by students in the Couple and Family Therapy area.

**Couple and Family Therapy**

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<th>Course Code</th>
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<tr>
<td>FRAN*6090</td>
<td>Power Relations and Diversity in CFT U [0.50]</td>
<td>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.</td>
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<tr>
<td>Restriction(s):</td>
<td>Instructor consent required for non Couple and Family Therapy students.</td>
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<td>Department(s):</td>
<td>Department of Family Relations and Applied Nutrition</td>
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| FRAN*6090 Practicum in Couple and Family Therapy* U [1.00] | 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 field of study. | 
| Department(s): | Department of Family Relations and Applied Nutrition | 

| FRAN*6095 Externship in Couple and Family Therapy S [1.00] | 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 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. | 
| 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 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. | 
| Restriction(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. | 
| Restriction(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. | 
| Restriction(s): | Instructor consent required for non Couple and Family Therapy students. | 
| Department(s): | Department of Family Relations and Applied Nutrition | 

| FRAN*6160 Introduction to Systemic Practice in Couple and Family Therapy F [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): | Available only to students in the Couple and Family Therapy field of study. | 
| Department(s): | Department of Family Relations and Applied Nutrition | 

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January 28, 2020
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<th>Course Code</th>
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<tr>
<td>FRAN*6180</td>
<td>Research Issues in Couple and Family Therapy</td>
<td>The focus of this course is on research in Couple &amp; 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.</td>
<td>Offered in alternate years.</td>
<td>Instructor consent required for non FRAN students.</td>
<td>Department of Family Relations and Applied Nutrition</td>
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<tr>
<td>FRAN*6350</td>
<td>Major Research Paper U</td>
<td>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.</td>
<td>Available only to students in the Couple and Family Therapy field of study.</td>
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<td>Department of Family Relations and Applied Nutrition</td>
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* 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

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BSc, MSc Guelph - Chief Economist, Strategic Policy Branch, OMAFRA

Alexandra Grygorczyk
BSc, MSc McGill; PhD Guelph - Research Scientist, Vineland Research & Innovation Centre

Shannon Majowicz
BSc, MSc, PhD Guelph - Associate Professor, Waterloo

Ken McEwan
BSc, MSc Guelph - College Professor, Ridgetown Campus Director

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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).
- Advanced microeconomic theory at the undergraduate level is strongly recommended as preparation for the course work in the MFARE program.

The Graduate Program Committee examines each application before the student is proposed to the Office of Graduate & Postdoctoral Studies for admission into the program.

Program Requirements

All MFARE students in the Department are required to establish an Advisory Committee and submit the Advisory Committee Appointment form to the Office of Graduate Studies not later than the midpoint of the student’s second registered semester. Until that time, they are advised by the Departmental Graduate Program Committee.

The advisory committee comprises of at least two graduate faculty members, the chair of which committee is normally the advisor of the student's program. The other member may be from the Department or another member of graduate faculty (who may be from another department when appropriate).

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).
- Advanced microeconomic theory at the undergraduate level is strongly recommended as preparation for the course work in the MSc program.

The Graduate Program Committee examines each application before the student is proposed to the Office of Graduate & Postdoctoral Studies for admission into the program.

Program 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*6600 [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.

Program 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:

FARE*6000 [0.50] Microeconomic Theory I
FARE*6601 [0.50] Microeconomic Theory II

Economic Research Methods:

ECON*6140 [0.50] Econometrics I
ECON*6160 [0.50] Econometrics II
FARE*6610 [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*6640 [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*3710 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

FARE*6990 Applied Quantitative Methods for Agricultural Economists II W [0.50]

Students will develop econometric methods and models that will provide solutions to a “real world” economic problem posed by an economic firm. Along a second vein, students will replicate the empirical findings of a published paper central to their thesis. Advanced quantitative methods will be introduced.

Prerequisite(s): FARE*6970

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): AGEC*6910 or FARE*6910 or equivalent

Department(s): Department of Food, Agricultural and Resource Economics
**Economics of Food Markets**

**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

**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*6930 Food Firms, Consumers and Market 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):* AGEC*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):* AGEC*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 FS,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
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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Keith Warriner
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.

Program 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 Food Safety and Quality Assurance Seminar [0.50]
- FSQA*6500 Food Safety and Quality Assurance Research Project [1.00]

This project is equal to 1.0 credit and counts as one course of the eight required courses.

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.

Program Requirements

All students must complete the following five courses:

- FSQA*6100 Food Law and Policy [0.50]
- FSQA*6150 Food Law and Policy [0.50]
- FSQA*6200 Food Safety Systems Management [0.50]
- FSQA*6600 Principles of Food Safety and Quality Assurance [0.50]
- POPM*6350 Safety of Foods of Animal Origins [0.50]

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 masters collaborative specialization.

Courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>FSQA*6000</td>
<td>Food Safety and Quality Assurance Seminar</td>
<td>0.50</td>
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<tr>
<td>FSQA*6100</td>
<td>Food Law and Policy</td>
<td>0.50</td>
</tr>
<tr>
<td>FSQA*6150</td>
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<tr>
<td>FSQA*6200</td>
<td>Food Safety Systems Management</td>
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<tr>
<td>FSQA*6600</td>
<td>Principles of Food Safety and Quality Assurance</td>
<td>0.50</td>
</tr>
<tr>
<td>POPM*6350</td>
<td>Safety of Foods of Animal Origins</td>
<td>0.50</td>
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</tbody>
</table>
FSQA*6150 Food Quality Assurance Management W [0.50]
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.
Offering(s): Offered through Distance Education format only.
Department(s): Department of Food Science

FSQA*6200 Food Safety Systems Management W [0.50]
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.
Offering(s): Offered through Distance Education format only.
Department(s): Department of Food Science

FSQA*6500 Food Safety and Quality Assurance Research Project S,F,W [1.00]
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.
Department(s): Department of Food Science

FSQA*6600 Principles of Food Safety and Quality Assurance F [0.50]
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.
Offering(s): Offered through Distance Education format only.
Department(s): 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 Heath 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

Undergraduate Courses Suitable for Credit in this Program

Food Science
FOOD*3030 [0.50] Food Chemistry I
FOOD*4190 [0.50] Advanced Food Analysis
FOOD*4090 [0.50] Functional Foods and Nutraceuticals

Human Health and Nutritional Sciences
NUTR*4510 [0.50] Toxicological Aspects of Nutrition

Population Medicine
POPM*4040 [0.50] Epidemiology of Food-Borne Diseases
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.

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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 89 (internet-based) or IELTS score of at least 6.5. 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.

Program 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 evaluation of the student’s performance to date in the doctoral level. Students may be admitted into the Fall, Winter or Summer semesters.

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 89 (internet-based) or IELTS score of at least 6.5.

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.

Program 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.

Collaborative Specializations

One Health

The Department of Food Science participates in the collaborative specialization in One Health. Master’s and Doctoral students wishing to undertake thesis research or their major research paper/project with an emphasis on one health are eligible to apply to register concurrently in Food Science and the collaborative specialization. Students should consult the One Health listing for more information.

Courses

Note
Course content for "Special Topics" will vary according to the research interests of the faculty involved in offering the course.

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.

Administrative Staff

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Joubert Satyre
BA Etat d'Haïti, MEd, PhD Montréal - Associate Professor

Clive Thomson
BA Trinity College, MA, PhD Toronto - Professor

MA Program

During their first two semesters of course work, students may take a range of courses in Quebec, continental French, African and Caribbean literatures, as well as in intermediality, literary translation 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.

Program Requirements

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 three 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*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.

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.

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, méttisage and creolization.

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.

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.

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.

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.

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.

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

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

2019-2020 Graduate Calendar January 28, 2020
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.

Program 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.

Program 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 advisor 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.

One Health
The Department of Geography participates in the collaborative specialization in One Health. Master’s and Doctoral students wishing to undertake thesis research or their major research paper/project with an emphasis on one health are eligible to apply to register concurrently in Geography and the collaborative specialization. Students should consult the One Health listing for more information.

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*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

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| Note | (*indicates approved PhD Advisors) |

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Catherine Carstairs *
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Bill Cormack *
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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 Hayday *
BA Toronto, MA, PhD Ottawa - Professor

Suzannah 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)

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BA, MA McGill, PhD Edinburgh - Professor

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BA, MA Ahmadu Bello, PhD York - Associate Professor

Sofie Lachapelle *
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Brittany Luby *
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Darryl Dee
PhD Emory

Peter Farrugia
DPhil Oxon

Judith Fletcher
PhD Biny Mawr

Leonard G. Friesen
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Jeff Grischow
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Erich Haberer
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BA, MA, PhD British Columbia - Professor

BA Guelph, MA, PhD Queen's - Francis and Ruth Redelmeier Professor of Rural History

BA St. Olaf College, MA, PhD Chicago - Associate Professor

PhD Guelph

PhD Chicago

PhD York

PhD Toronto

PhD Guelph

PhD Toronto

PhD Emory

DPhil Oxon

PhD Biny Mawr

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PhD Queen's

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PhD Wilfrid Laurier University

PhD Toronto

BA Toronto, MA, PhD Ottawa - Professor

BA Trent, BEd Queen's, MA, PhD Johns Hopkins - Associate Professor

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BA Queen’s, MA, PhD York - Assistant Professor

BA Saskatchewan, M Litt, PhD Glasgow - Professor

BA Toronto, MS Renselaer PI, MA, PhD Princeton - Associate Professor

BA, MSt, DPhil Oxford - Professor

BA British Columbia, MA, PhD Toronto - Professor

BA, MA Simon Fraser, PhD California (Berkeley) - Professor and Graduate Program Coordinator

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PhD Queen's

PhD Toronto

PhD Toronto

PhD Western University

PhD York

PhD Wilfrid Laurier University

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Lynne Taylor
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Ryan Touhey
BA, MA Ottawa, PhD Waterloo

James W. Walker
PhD 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.

Program 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. 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.

Program 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 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. Thesis defense (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.

One Health
The Department of History participates in the collaborative specialization in One Health. Master's and Doctoral students wishing to undertake thesis research or their major research paper/project with an emphasis on one health are eligible to apply to register concurrently in History and the collaborative specialization. Students should consult the One Health listing for more information.

Courses - MA

Canadian History

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>HIST*6230</td>
<td>Canada: Culture and Society</td>
<td>U [0.50]</td>
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<tr>
<td>HIST*6231</td>
<td>Canada: Culture and Society Research</td>
<td>U [0.50]</td>
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<tr>
<td>HIST*6280</td>
<td>Canada: Community and Identity</td>
<td>U [0.50]</td>
</tr>
<tr>
<td>HIST*6281</td>
<td>Canada: Community and Identity Research</td>
<td>U [0.50]</td>
</tr>
</tbody>
</table>

Scottish History

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>HIST*6150</td>
<td>Scottish Archival Research</td>
<td>U [0.50]</td>
</tr>
<tr>
<td>HIST*6190</td>
<td>Topics in Scottish History I</td>
<td>U [0.50]</td>
</tr>
<tr>
<td>HIST*6191</td>
<td>Scottish History I Research</td>
<td>U [0.50]</td>
</tr>
<tr>
<td>HIST*6200</td>
<td>Scottish Highland and Lowland History</td>
<td>U [0.50]</td>
</tr>
<tr>
<td>HIST*6201</td>
<td>Scottish Highland and Lowland Research</td>
<td>U [0.50]</td>
</tr>
</tbody>
</table>

Note
For the courses offered in a particular year, see the listing published by the Office of Registrarial Services.
### European History

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIST*6300</td>
<td>Topics in Modern European History I U [0.50]</td>
<td></td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td>Department(s): Department of History</td>
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<tr>
<td>HIST*6301</td>
<td>Modern European History Research I U [0.50]</td>
<td></td>
<td>Continuation of HIST*6300 in which students prepare an in-depth research paper based on primary sources.</td>
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<tr>
<td></td>
<td>Prerequisite(s): HIST*6300</td>
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<td>Restriction(s): Instructor consent required.</td>
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<td>Department(s): Department of History</td>
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<tr>
<td>HIST*6311</td>
<td>Modern European History Research II U [0.50]</td>
<td></td>
<td>Continuation of HIST*6310 in which students prepare an in-depth research paper based on primary sources.</td>
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<tr>
<td></td>
<td>Prerequisite(s): HIST*6310</td>
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<td>Restriction(s): Instructor consent required.</td>
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<td>Department(s): Department of History</td>
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<tr>
<td>HIST*6361</td>
<td>Topics in Modern European History II U [0.50]</td>
<td></td>
<td>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.</td>
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<td>Department(s): Department of History</td>
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<tr>
<td>HIST*6380</td>
<td>Topics in Early Modern European History U [0.50]</td>
<td></td>
<td>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.</td>
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<tr>
<td></td>
<td>Prerequisite(s): HIST*6380</td>
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<td>Restriction(s): Instructor consent required.</td>
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<td>Department(s): Department of History</td>
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<tr>
<td>HIST*6381</td>
<td>Early Modern European History Research U [0.50]</td>
<td></td>
<td>Continuation of HIST*6380 in which students prepare an in-depth research paper based on primary sources.</td>
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<tr>
<td></td>
<td>Prerequisite(s): HIST*6380</td>
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<td>Restriction(s): Instructor consent required.</td>
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<td>Department(s): Department of History</td>
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<tr>
<td>HIST*6500</td>
<td>Topics in Global History U [0.50]</td>
<td></td>
<td>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.</td>
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<td>Department(s): Department of History</td>
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<tr>
<td>HIST*6501</td>
<td>Global History Research U [0.50]</td>
<td></td>
<td>Continuation of HIST*6500 in which students prepare an in-depth research paper based on primary sources.</td>
</tr>
<tr>
<td></td>
<td>Prerequisite(s): HIST*6500</td>
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<td>Restriction(s): Instructor consent required.</td>
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<td>Department(s): Department of History</td>
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<tr>
<td>HIST*6520</td>
<td>Topics in Latin American History U [0.50]</td>
<td></td>
<td>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.</td>
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<td></td>
<td>Department(s): Department of History</td>
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</tr>
<tr>
<td>HIST*6521</td>
<td>Latin American History Research U [0.50]</td>
<td></td>
<td>Continuation of HIST*6520 in which students prepare an in-depth research paper based on primary sources.</td>
</tr>
<tr>
<td></td>
<td>Prerequisite(s): HIST*6520</td>
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<td>Restriction(s): Instructor consent required.</td>
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<td>Department(s): Department of History</td>
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### World History

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<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>HIST*6590</td>
<td>Topics in Global History U [0.50]</td>
<td></td>
<td>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.</td>
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<td>Department(s): Department of History</td>
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### Thematic

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<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIST*6000</td>
<td>Historiography U [0.50]</td>
<td></td>
<td>This course will introduce students to some of the essential components of the historical process. It will also assess history as a cognitive discipline in contemporary society. While the scope of the course may extend from ancient times to the present, emphasis on the historiography of particular periods may vary according to instructor expertise and student research needs.</td>
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<td></td>
<td>Restriction(s): Instructor consent required.</td>
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<td>Department(s): Department of History</td>
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<tr>
<td>HIST*6040</td>
<td>Special Reading Course U [0.50]</td>
<td></td>
<td>Students selecting this course should speak to individual instructors to arrive at appropriate topics.</td>
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<td>Restriction(s): Instructor consent required.</td>
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<td>Department(s): Department of History</td>
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<tr>
<td>HIST*6360</td>
<td>History of Sexuality and Gender U [0.50]</td>
<td></td>
<td>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.</td>
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<td>Restriction(s): Instructor consent required.</td>
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<td>Department(s): Department of History</td>
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<tr>
<td>HIST*6400</td>
<td>Major Paper U [1.00]</td>
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<td>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.</td>
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<td>Department(s): Department of History</td>
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<tr>
<td>HIST*6450</td>
<td>Quantitative Evidence and Historical Methods U [0.50]</td>
<td></td>
<td>An overview of the use for historical research of quantitative evidence and methodologies.</td>
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<td>Restriction(s): Instructor consent required.</td>
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<td>Department(s): Department of History</td>
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<tr>
<td>HIST*6550</td>
<td>Rural History U [0.50]</td>
<td></td>
<td>The countryside was not the city in overall; 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.</td>
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<td>Restriction(s): Instructor consent required.</td>
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<td>Department(s): Department of History</td>
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<tr>
<td>HIST*6570</td>
<td>Health, Science, Medicine U [0.50]</td>
<td></td>
<td>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.</td>
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<td>Restriction(s): Instructor consent required.</td>
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<td>Department(s): Department of History</td>
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<tr>
<td>Course Code</td>
<td>Course Name</td>
<td>Prerequisite(s)</td>
<td>Restriction(s)</td>
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<tr>
<td>HIST*6580</td>
<td>Health, Science, Medicine Research U</td>
<td>Continuation of HIST*6570 in which students prepare an in-depth research paper based on primary sources.</td>
<td></td>
</tr>
<tr>
<td>HIST*6590</td>
<td>Public History, Heritage, and Historical Consciousness U</td>
<td>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.</td>
<td>Instructor consent required.</td>
</tr>
<tr>
<td>HIST*6600</td>
<td>Public History Research U</td>
<td>Continuation of HIST*6590 in which students prepare an in-depth research paper based on primary sources.</td>
<td>Instructor consent required.</td>
</tr>
<tr>
<td>HIST*6610</td>
<td>Histories of Tourism and Travel U</td>
<td>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.</td>
<td></td>
</tr>
<tr>
<td>HIST*6620</td>
<td>Tourism, and Travel Histories Research U</td>
<td>Continuation of HIST*6610 in which students prepare an in-depth research paper based on primary sources.</td>
<td>Instructor consent required.</td>
</tr>
<tr>
<td>HIST*6630</td>
<td>Indigenous Research Relations and Methodologies F,W</td>
<td>This course examines the development of Indigenous research methodologies in the academy in North America and invites students to engage in contemporary debates about how to best research and represent Indigenous issues. Students will consider the politics of knowledge mobilization, academic freedom, and intellectual theft.</td>
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<tr>
<td>Courses - PhD</td>
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<tr>
<td>HIST*7000</td>
<td>Professional Development Seminar U</td>
<td>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.</td>
<td></td>
</tr>
<tr>
<td>HIST*7010</td>
<td>Qualifying Examination U</td>
<td>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.</td>
<td></td>
</tr>
<tr>
<td>HIST*7030</td>
<td>Language Requirement U</td>
<td>A written demonstration of the student's knowledge of written French (or other appropriate second language).</td>
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</tr>
<tr>
<td>HIST*7040</td>
<td>Major Field U</td>
<td>The examination written following completion of the major field seminar and before the oral qualifying examination.</td>
<td></td>
</tr>
<tr>
<td>HIST*7070</td>
<td>Thesis Proposal U</td>
<td>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.</td>
<td>For PhD students only.</td>
</tr>
</tbody>
</table>

**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

- **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
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.

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
Coral L. Murrant (354 Animal Science/Nutrition Bldg., Ext. 56173)
cmurrant@uoguelph.ca

Associate Chair
Lindsay E. Robinson (336B Animal Science/Nutrition Bldg., Ext. 52297)
lrobinson@uoguelph.ca

Graduate Program Coordinator
Graham Holloway (332 Animal Science/Nutrition Bldg., Ext. 53688)
ghollowa@uoguelph.ca

Assistant Graduate Program Coordinator for MSc by Coursework and Project Program
Alison M. Duncan (347 Animal Science/Nutrition Bldg., Ext. 53416)
amduncan@uoguelph.ca

Graduate Program Assistant
Andra Williams (352 Animal Science/Nutrition Bldg., Ext. 56536)
chshhnsgrad@uoguelph.ca

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. Betterg
BS, PhD Missouri - Associate Professor

Stephen Brown
BHK, MKH Windsor, PhD Waterloo - Associate Professor

Jamie Burr
BA Western, MSc, PhD York - Assistant Professor

Andrea Clark
BSc Loughborough, PhD Calgary - Assistant Professor

Amanda Wright
BSc, MA Ottawa, PhD Waterloo - Associate Professor

Lori A. Vallis
BSc, MA Ottawa, PhD Waterloo - Associate Professor

Amanda Wright
BSc, PhD Guelph - Associate Professor

David Wright
BSc, PhD Guelph - Associate Professor

John Z. Srbely
BSc, PhD Guelph, PhD McMaster - Professor

Lawrence L. Spriet
BSc Waterloo, MSc York, PhD McMaster - Professor

John Z. Srbely
BSc Toronto, DC Canadian Memorial Chiropractic College, PhD Guelph - Associate 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 - Professor

John L. Zettel
BS Waterloo, MSc, PhD Toronto - Assistant Professor

Associated Graduate Faculty

Jennifer Monk
BSc, PhD Guelph - Biologist, Guelph Research and Development Centre, Agriculture and Agri-Food Canada

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 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 their 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.

Program Requirements

Students enrol in one of two study options: 1) thesis, or 2) course work and major research project.
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 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 2 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 their 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.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Department(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HHNS*6440</td>
<td>Nutrition, Gene Expression and Cell Signalling W [0.50]</td>
<td>0.50</td>
<td>Department of Human Health and Nutritional Sciences</td>
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<tr>
<td>HHNS*6500</td>
<td>Cardiovascular and Respiratory Physiology F [0.50]</td>
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<td>Department of Human Health and Nutritional Sciences</td>
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<tr>
<td>HHNS*6700</td>
<td>Nutrition, Exercise and Metabolism F [0.50]</td>
<td>0.50</td>
<td>Department of Human Health and Nutritional Sciences</td>
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<tr>
<td>HHNS*6710</td>
<td>Advanced Topics in Nutrition and Exercise F [0.50]</td>
<td>0.50</td>
<td>Department of Human Health and Nutritional Sciences</td>
</tr>
<tr>
<td>HHNS*6800</td>
<td>Research Frontiers in Integrative Biomechanics and Neurophysiology F [0.50]</td>
<td>0.50</td>
<td>Department of Human Health and Nutritional Sciences</td>
</tr>
<tr>
<td>HHNS*6810</td>
<td>Research Methods in Integrative Biomechanics and Neurophysiology I F [0.50]</td>
<td>0.50</td>
<td>Department of Human Health and Nutritional Sciences</td>
</tr>
<tr>
<td>HHNS*6820</td>
<td>Research Methods in Integrative Biomechanics and Neurophysiology II W [0.50]</td>
<td>0.50</td>
<td>Department of Human Health and Nutritional Sciences</td>
</tr>
<tr>
<td>HHNS*6910</td>
<td>Basic Research Techniques and Processes S,F,W [0.50]</td>
<td>0.50</td>
<td>Department of Human Health and Nutritional Sciences</td>
</tr>
<tr>
<td>HHNS*6920</td>
<td>Applied Research Techniques and Processes S,F,W [0.50]</td>
<td>0.50</td>
<td>Department of Human Health and Nutritional Sciences</td>
</tr>
<tr>
<td>HHNS*6930</td>
<td>Research Project S,F,W [0.50]</td>
<td>0.50</td>
<td>Department of Human Health and Nutritional Sciences</td>
</tr>
</tbody>
</table>

This course emphasizes the role of nutrients 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)

This course uses 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 strengthening critical analysis skills and both oral and written communication skills through learning about the cardiovascular and respiratory system and how they integrate.

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.

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.

Prerequisite(s): HHNS*6910 or HHNS*6920

Restriction(s): Restricted to HHNS MSc. course work and project students. Instructor consent required.

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.

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.

Prerequisite(s): HHNS*6810

Restriction(s): Restricted to HHNS MSc. course work and project students. Instructor consent required.
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.

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**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 their 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.

Program Requirements
Students must complete and defend an acceptable thesis. In addition, they must successfully complete courses totaling no 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 "Special Topics in ..." 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 "Advances in 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, a student can register in an "Advances in Integrative Biology" course to combine a senior-level undergraduate course in ecology, evolutionary biology, or comparative physiology with an additional component – typically a major paper or research project. Students should approach individual faculty members that teach the senior-level undergraduate course, and in consultation with their thesis advisor.

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 eight 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 their thesis advisor.

An acceptable MSc thesis comprises a scientifically defensible account of the student's research on a particular, 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 One Health, 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.

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James R. Taylor
BSLA Iowa State, MLA California-Berkeley, FCSLA, FASLA, FCELA, OALA - Professor Emeritus, School of Environmental Design and Rural Development

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 broadly 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/grad/

Program 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*6470 [0.50] Critical Inquiry & Research Analysis
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

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

Research

Students may expect to devote at least the equivalent of two full-time semesters to their research. To avoid undue prolongation of their program, students are expected to have their thesis proposal prepared and approved at least two full semesters in advance of their anticipated degree completion date.

Thesis

For the Master of Landscape Architecture degree, students are encouraged to undertake scholarship of discovery, integration, application, and/or communication. This work typically includes identification of clear goals, adequate preparation, selection and application of appropriate methods, identification and discussion of results, effective written and graphic communication, and reflective critique.

For the Master of Landscape Architecture degree, each candidate shall submit a thesis, communicated in an appropriate form, based upon scholarship on a topic related to landscape architecture. The thesis must demonstrate the candidate’s capacity for original and independent work, and should include a critical evaluation of work that has previously been done in the candidate’s area of investigation. The thesis should emphasize any new conclusions resulting from the candidate’s scholarly investigation. Special emphasis should be placed on the communication of how the results inform landscape architecture.

Procedures

The thesis may be submitted at any time of the year, but candidates are encouraged to have the final examination well in advance of the deadline date for thesis submission. Candidates should be aware of the deadlines schedule, a copy of which may be obtained in the Office of Graduate and Postdoctoral Studies. Candidates should discuss their thesis manuscript with their Advisor(s) early in their final semester.

As the thesis is being written, the candidate is expected to be in regular communication with the Advisory Committee. The draft thesis is sent to the members of the Advisory Committee and the final oral examination is scheduled and held.

Program Regulations

The Master of Landscape Architecture program has specified regulations in addition to those described in this calendar. The student is responsible for consulting the department concerning these regulations. University regulations, as specified herein, take precedence, and may not be overruled by any department regulation.

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

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
IX. Graduate Programs, Latin American and Caribbean Studies

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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Jordi Díez
BA Toronto, MA Essex, PhD Toronto - Professor, Political Science

Susan Douglas
BA Western Ontario, MA Carleton, PhD Concordia - Assistant Professor, Art History, SOFAM

Rosario Gómez
BA, MA, PhD Toronto - Associate Professor, Linguistics, SOLAL

Spencer Henson
BSc, PhD University of Reading - Professor, Food Economics and Safety

Stephen Henighan
BA Swarthmore College, MA Concordia, D Phil Oxford - Professor, Latin American Literature and Culture, SOLAL

Sally Humphries
BA, MA, PhD York - Associate Professor, Sociology

Kris Inwood
BA Trent, MA, PhD Toronto - Professor, Joint appointment History and Economics

Candace Johnson
BA Toronto, MA, PhD Dalhousie - Associate Professor, Political Science

Lisa Kowalchuk
BA McMaster, MA McGill, PhD York - Associate Professor, Sociology

Stuart McCook
BA Toronto, MS Rensselaer, MA, PhD Princeton - Associate Professor, History

Alan McDougall
BA MST, DPhil Oxford - Professor, History

Kate Parizeau
PhD, University of Toronto - Associate Professor, Geography

Karen Racine
BA Saskatchewan, MA, PhD Tulane - Associate Professor, History

Pablo Ramirez
BA Yale, MFA Miami, MA, PhD Michigan - Associate Professor, Latina/o Studies, SETS

Joubert Satyre
BA State University, Port-au-Prince, MA, PhD Montréal - Associate Professor, French Caribbean

Howard Spring
BFA, MFA York, PhD Illinois - Associate Professor, Caribbean Music, SOFAM

Tony Winson
BA Western Ontario, MA, PhD Toronto - Professor, Sociology

Gordana Yovanovich
BA Carleton, MA, PhD Toronto - Professor, Latin American Literature and Culture, SOLAL

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.

Program 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.

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

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. 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

LACS*6000 Research Methods Seminar U [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

LACS*6010 Latin American Identity & Culture F [0.50]

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.

Department(s): School of Languages and Literatures

LACS*6020 Re-Imagining Community in Latin America W [0.50]

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.

Department(s): 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

**List of Courses**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>ECON*6350</td>
<td>Economic Development</td>
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<tr>
<td>ECON*6370</td>
<td>Economic Development in Historical Perspective</td>
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<td>ENGL*6811</td>
<td>Special Topics in English</td>
<td>[0.50]</td>
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<tr>
<td>FREN*6022</td>
<td>Topics in Caribbean and African Literatures</td>
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<tr>
<td>HIST*6500</td>
<td>Topics in Global History</td>
<td>[0.50]</td>
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<tr>
<td>HIST*6520</td>
<td>Topics in Latin American History</td>
<td>[0.50]</td>
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<tr>
<td>HIST*6521</td>
<td>Latin American History Research</td>
<td>[0.50]</td>
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<td>POLS*6050</td>
<td>The Politics of Identity</td>
<td>[0.50]</td>
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<tr>
<td>SOC*6270</td>
<td>Diversity and Social Equality</td>
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<tr>
<td>SOC*6420</td>
<td>Global Agro-Food Systems, Communities and Rural Change</td>
<td>[0.50]</td>
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<tr>
<td>SOC*6460</td>
<td>Gender and Development</td>
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</table>
Leadership

The Master of Arts (MA) in 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 in 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.

Program 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 program within 18-24 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 the following two options:

Course Work and Major Research Project

Students must complete six online courses (3.0 credits), two residency courses (1.0 credit) and the major research project (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 online courses (3.0 credits), two residency courses (1.0 credit) and two additional online 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.

Restriction(s): Lang Executive Programs students only
Department(s): 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.

Restriction(s): Lang Executive Programs students only
Department(s): 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.

Restriction(s): Lang Executive Programs students only
Department(s): Executive Programs

LEAD*6220 Strategic Leadership and Management U [0.50]

As a research-intensive course in the MA in Leadership program, 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.

Restriction(s): Lang Executive Programs students only
Department(s): 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.

Restriction(s): Lang Executive Programs students only
Department(s): 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): Lang 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): Lang Executive Programs students only
Department(s): Executive Programs

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.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<td>LEAD*6500</td>
<td>Ethics in Leadership U</td>
<td>[0.50]</td>
</tr>
<tr>
<td>LEAD*6600</td>
<td>Foundations of Leadership for Retirement and Senior Living U</td>
<td>[0.50]</td>
</tr>
<tr>
<td>LEAD*6720</td>
<td>Politics of Organizations U</td>
<td>[0.50]</td>
</tr>
<tr>
<td>LEAD*6740</td>
<td>Coaching and Developing Others U</td>
<td>[0.50]</td>
</tr>
<tr>
<td>LEAD*6800</td>
<td>Personal Skill Self-Assessment U</td>
<td>[0.50]</td>
</tr>
<tr>
<td>LEAD*6900</td>
<td>Major Research Project U</td>
<td>[1.00]</td>
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</table>

**Electives**

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<tr>
<th>Course Code</th>
<th>Course Title</th>
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</thead>
<tbody>
<tr>
<td>BUS*6400</td>
<td>[0.50] Canadian Business Law: Addressing Legal Issues in Organizations</td>
</tr>
</tbody>
</table>
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

Director
Dr. Ann Wilson (425 MacKinnon, Ext. 53881) annwilso@uoguelph.ca

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Gregor Campbell (431 MacKinnon, Ext. 53255) gregorc@uoguelph.ca

Graduate Program Assistant
Olga Petrik (427 McKinnon, Ext. 56315) petriko@uoguelph.ca

Graduate Faculty

Christine Bold
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Dionne Brand
BA, MA Toronto - Professor

Susan Brown
BA King's College and Dalhousie, MA Dalhousie, PhD Alberta - Professor and Canada Research Chair

Julie Cairnie
BA Brock, MA, PhD York - Associate Professor

Gregor Campbell
BA, MA, PhD Toronto - Assistant Professor

Elaine Chang
BA UBC, AM, PhD Stanford - Associate Professor

Michelle Elleray
BA Victoria (Wellington), MA Auckland, MA, PhD Cornell - Associate Professor

Alan Filewod
BA York, MA Alberta, PhD Toronto - Professor

Jade Ferguson
BA UBC, MA, PhD Cornell - Associate Professor

Daniel Fischlin
BFA, MA Concordia, PhD York - Professor and University Research Chair

Mark Fortier
BA Windsor, MA Toronto, PhD York, LLB Toronto - Professor

Sky Gilbert
BFA York, MA PhD Toronto - Associate Professor

Ajay Heble
BA Toronto, MA Dalhousie, PhD Toronto - Professor

Mark Lipton
BA Concordia, MA, PhD New York - Associate Professor

Kimberley McLeod
BA Queen's, MA Alberta, PhD York - Assistant Professor

Martha J. Nandorfy
BA, MA Ottawa, PhD Toronto - Professor

Daniel O’Quinn
BSc, MA Western, PhD York - 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 their 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 their 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 leeway 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 their 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**

<table>
<thead>
<tr>
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<th>Credits</th>
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<tbody>
<tr>
<td>ENGL*6209</td>
<td>Topics in Colonial, Postcolonial and Diasporic Literature</td>
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<tr>
<td>ENGL*6412</td>
<td>Topics in Medieval/Renaissance Literature</td>
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<tr>
<td>ENGL*6421</td>
<td>Topics in Eighteenth Century and Romantic Literature</td>
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<td>ENGL*6431</td>
<td>Topics in Nineteenth Century Literature</td>
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<tr>
<td>ENGL*6441</td>
<td>Topics in Modern British Literature</td>
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<td>ENGL*6451</td>
<td>Topics in American Literature</td>
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<td>ENGL*6611</td>
<td>Topics in Women's Writing</td>
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<td>ENGL*6621</td>
<td>Topics in Children's Literature</td>
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<td>ENGL*6641</td>
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<td>ENGL*6691</td>
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<tr>
<td>ENGL*6802</td>
<td>Reading Course II</td>
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**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

<table>
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<tr>
<th>Course Code</th>
<th>Title</th>
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<td>THST*6150</td>
<td>Theatre Historiography</td>
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<td>THST*6210</td>
<td>Devising</td>
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<tr>
<td>THST*6220</td>
<td>Theatre Theory</td>
</tr>
<tr>
<td>THST*6230</td>
<td>Performance and Difference</td>
</tr>
<tr>
<td>THST*6250</td>
<td>Bodies and Space in Performance</td>
</tr>
<tr>
<td>THST*6801</td>
<td>Reading Course I</td>
</tr>
<tr>
<td>THST*6802</td>
<td>Reading Course II</td>
</tr>
<tr>
<td>ENGL*6002</td>
<td>Topics in the History of Criticism</td>
</tr>
<tr>
<td>ENGL*6003</td>
<td>Problems of Literary Analysis</td>
</tr>
<tr>
<td>ENGL*6201</td>
<td>Topics in Canadian Literature</td>
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</table>
Management

The MA in Management program provides an awareness to theories of management, research methods, data analysis and other core management topics. It also requires a Major Research Project (MRP) completion with the guidance and supervision of a member of the graduate faculty.

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 Gordon S. Lang School 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

Chair
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sjscott@uoguelph.ca

Graduate Program Coordinator
Michele Bowring (224 MAC, Ext. 52292)
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Trent Tucker
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Agnes Zdniuk
BA, MAsc, PhD Waterloo - Associate Professor

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HS Chris Choi
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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. Courses are designed in a hybrid format with a mix of face-to-face meetings, seminars and lectures as well as online learning. The completion of a major research project will also be undertaken during the course of the degree.

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. Courses are designed in a hybrid format with a mix of face-to-face meetings, seminars and lectures as well as online learning. 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 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 areas in the field/profession.

Program Requirements
Overall Requirements (5.0 credits)
1.0 credits – core courses
2.5 credits -field specific electives
0.5 credit – restricted electives
1.0 credit – Major Research Project (MRP)
0.0 credit – Seminar Series course (Fall and Winter Semester)

Core Courses:
MGMT*6100 [0.50] Evidence Based Management Research
MGMT*6200 [0.50] Leadership Assessment and Development

Fields
Management Research
MGMT*6130 [0.50] Creative Process of Innovation
MGMT*6300 [0.50] Business Consulting
MGMT*6400 [0.50] Project Management
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 related discipline 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 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) results when applying.

**Program 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 their 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 Gordon S. Lang School of Business and Economics, who have already taken some of the required courses, 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 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**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Credits</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>MGMT*6950</td>
<td>0.50</td>
<td>Doctoral Research Seminar</td>
</tr>
<tr>
<td>MGMT*6820</td>
<td>0.50</td>
<td>Theory of Management</td>
</tr>
<tr>
<td>MGMT*6830</td>
<td>0.50</td>
<td>Applied Univariate Statistical Analysis for Management</td>
</tr>
</tbody>
</table>

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

### Year 2

**Semester 2**

<table>
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<tbody>
<tr>
<td>MGMT*6950</td>
<td>0.50</td>
<td>Doctoral Research Seminar</td>
</tr>
<tr>
<td>MGMT*6840</td>
<td>0.50</td>
<td>Quantitative Research Methods: Multivariate Techniques</td>
</tr>
<tr>
<td>MGMT*6850</td>
<td>0.50</td>
<td>Qualitative Research Methods</td>
</tr>
</tbody>
</table>

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**

<table>
<thead>
<tr>
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<th>Course Title</th>
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<tbody>
<tr>
<td>MGMT*6800</td>
<td>0.50</td>
<td>Philosophy of Social Science Research</td>
</tr>
<tr>
<td>MGMT*6900</td>
<td>0.00</td>
<td>PhD Research Seminar Project</td>
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</table>

### Year 3

**Semester 4**

<table>
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<tr>
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</thead>
<tbody>
<tr>
<td>MGMT*6950</td>
<td>0.50</td>
<td>Doctoral Research Seminar</td>
</tr>
<tr>
<td>UNIV*6800</td>
<td>0.50</td>
<td>University Teaching: Theory and Practice</td>
</tr>
</tbody>
</table>

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*6600 [0.50] Microeconomic Theory I
- ECON*6140 [0.50] Macroeconomics 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] from Elective Course List below.

**Semester 5**

<table>
<thead>
<tr>
<th>Course Code</th>
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<th>Course Title</th>
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<tbody>
<tr>
<td>MGMT*6950</td>
<td>0.00</td>
<td>Doctoral Research Seminar</td>
</tr>
</tbody>
</table>

**Qualifying Examination**

Required field course:

**Marketing and Consumer Behaviour: one of**

- MGMT*6860 [0.50] Research in Management Studies
- MGMT*6870 [0.50] Applied Univariate Statistical Analysis for Management
- MGMT*6880 [0.50] Marketing Management Theory
- MGMT*6900 [0.50] Organizational Behaviour
- MGMT*6910 [0.50] Marketing Research
- MGMT*6920 [0.50] Consumer Behaviour Theory II
- MGMT*6930 [0.50] Marketing Strategy
- MGMT*6940 [0.50] Marketing Management
- MGMT*6950 [0.50] Qualitative Research Methods
- MGMT*6960 [0.50] Quantitative Research Methods
- MGMT*6970 [0.50] Research Design and Statistics
- MGMT*6980 [0.50] Research in Management Studies

**Required Courses for Year 5**

- MGMT*6960 [0.50] Qualitative Research Methods
- MGMT*6970 [0.50] Research Design and Statistics
- MGMT*6980 [0.50] Research in Management Studies

**Note**

- Required courses are subject to change and are subject to approval by the Graduate Program Coordinator.
MA Courses

Core Courses

MGMT*6000 Management Seminar Series FW [0.00]
This seminar provides students with exposure to current and emerging research topics in the field of management. Academic speakers (faculty and students) present their work in weekly meetings. Students are encouraged to be engaged and participate actively during the presentations.

Restriction(s): Students in MA.MGMT
Department(s): Department of Management

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 processes, and personal development plan. This course emphasizes those techniques most frequently used in personal development and coaching individuals and teams.

Offerings(s): Offered through Distance Education and on-campus.
Restriction(s): Students in the MA in Management and Master of Conservation Leadership programs 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*6130 Creative Process of Innovation U [0.50]
This course is focused on the creative process of innovation required to effectively engage in problem solving and opportunity creation toward organizational and societal flourishing. Students will develop both a theoretical understanding and the practical skills to engage in creative experimentation for novel idea generation.

Department(s): Department of Management

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

International Development Studies

The Department of Management participates in the International Development Studies (IDS) MA 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.
### IX. Graduate Programs, 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.

**Restriction(s):** In Instructor consent required.
**Department(s):** Department of Management

#### 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.

**Restriction(s):** Students in MA.MGMT and GDip.ACCT
**Department(s):** Executive Programs

#### 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.

**Restriction(s):** Prerequisite(s): BUS*6800 (or may be taken concurrently)
**Department(s):** Department of Management

#### BUS*6840 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.

**Restriction(s):** Department(s): Department of Management

#### BUS*6880 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.

**Restriction(s):** Lang Executive Programs students only
**Department(s):** Executive Programs

#### BUS*6880 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.

**Restriction(s):** 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.

**Restriction(s):** Prerequisite(s): BUS*6800 (or may be taken concurrently)
**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 behavioral research within the fields of organizational, management, and consumer studies. Emphasis will be placed 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, Stats, and MLplus.

**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, analysis of variance, 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 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

#### MGMT*6880 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 behavior 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 placed 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, Stats, and MLplus.

**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, analysis of variance, 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 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
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

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 S [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 S [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 S [0.50]**  
  This course is designed 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
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**
Tirtha Dhar (203 Macdonald Institute, Ext. 52023)
tdhar@uoguelph.ca

**Graduate Program Coordinator**
Vinay Kanetkar (MINS 203, Ext. 52221)
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  BComm, MComm Burma, PhD York - Associate Professor

- **Scott R. Colwell**
  AGD MBA Athabasca, PhD Bradford (United Kingdom) - Associate Professor

- **Tim Dewhirst**
  BPHE Toronto, MA Queen's, PhD British Columbia - Professor

- **Tirtha Dhar**
  MA Delhi, MSc PhD Connecticut - Associate Professor and Chair

- **Rogier Holtermans**
  BSc, MSc, PhD Maastricht - Assistant Professor

- **Towhidul Islam**
  MSc Inst. of Mech. Tech. (Bulgaria), MBA Dhaka (Bangladesh), DIC Imperial College (United Kingdom), PhD London (United Kingdom) - Professor

- **Vinay Kanetkar**
  BA(R)h Indian Inst. of Tech., MArch, MSc, PhD British Columbia - Associate Professor

- **Amirali Kani**
  MBA Sharif Univ of Tech, MSc, PhD Pennsylvania - Assistant 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

- **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 their 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 their 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.

**Program Requirements**

The program normally consists of at least 6 half credit (3,0 full credit) courses, enrollment 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 their 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 enrollment 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

* 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 their advisory committee. Any Social Science Graduate level course may be substituted for the Elective.

**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.

January 28, 2020
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.

Program 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 Consumption Behaviour Theory I [0.50]
- MCS*6050 Research Methods in Marketing and Consumer Studies [0.50]
- MCS*6100 Marketing Theory [0.50]
- MCS*6950 Marketing & Consumer Studies Seminar [0.00]

**Winter Semester:**
- MCS*6060 Multivariate Research Methods [0.50]
- MCS*6080 Qualitative Research Methods [0.50]
- MCS*6950 Marketing & Consumer Studies Seminar [0.00]
- One of the following restricted electives
  - MCS*6010 Consumption Behaviour Theory II [0.50]
  - MCS*6120 Marketing Management [0.50]
  - MCS*6200 Marketing Analytics [0.50]

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*6110 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*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

**MCS*6970 Business & Marketing Research Seminar F,W [0.00]**
*Department(s):* Department of Marketing and Consumer Studies

**MCS*6975 Marketing Research Seminar F,W [0.00]**
*Department(s):* Department of Marketing and Consumer Studies

**MCS*6976 Research Seminar F,W [0.00]**
*Department(s):* Department of Marketing and Consumer Studies

**MCS*6980 Dissertation F,W [0.00]**
*Department(s):* Department of Marketing and Consumer Studies

**MCS*6985 Research Project F,W [0.00]**
*Department(s):* Department of Marketing and Consumer Studies

**MCS*6990 Professional Practicum F,W [0.00]**
*Department(s):* Department of Marketing and Consumer Studies

**MCS*6995 Independent Study F,W [0.00]**
*Department(s):* Department of Marketing and Consumer Studies

**MCS*6999 Thesis F,W [0.00]**
*Department(s):* Department of Marketing and Consumer Studies

**MCS*6999M Thesis M [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

Chair
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Graduate Faculty

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Daniel A. Ashlock
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Monica Cojocaru
BA, MSc Bucharest, PhD Queen's - Professor

Gerarda Darlington
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Anthony F. Desmond
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Dipl. Math (MSc), PhD Munich Univ. of Tech. - Professor

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Marcus R. Garvie
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Herb Kunze
BA, MA, PhD Waterloo - Professor

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BA, PhD Guelph - Assistant Professor

Khurram Nadeem
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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. - Professor

Associated Graduate Faculty

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

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 fulfills the requirement of a minor equivalent in statistics.

Program 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.

Program 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):

- **MATH*6801** [0.50] Statistical Learning
- **MATH*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.

Collaborative Specializations

Artificial Intelligence

The Department of Mathematics and Statistics participates in the collaborative specialization in Artificial Intelligence. MSc students wishing to undertake thesis research with an emphasis on artificial intelligence are eligible to apply to register concurrently in Mathematics and Statistics and the collaborative specialization. Students should consult the Artificial Intelligence listing for more information.

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, Lp 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 theories 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 for 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*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 I 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*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*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*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*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*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**
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**Manfred Brauer**
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**Joseph L. Colasanti**
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**Michael J. Emes**
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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**
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**Melissa Perreault**
BSc, MSc, PhD McMaster University - Assistant Professor

**Steven Rothstein**
BA Swarthmore College, PhD Wisconsin - Professor

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**Stephen Y.K. Seah**
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**Rebecca Shapiro**
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**Ian Telford**
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BSc, MSc, PhD Stellenbosch (South Africa) - Associate Professor

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**John Vessey**
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**Christopher Whitfield**
BSc Newcastle, PhD Edinburgh - Professor

**Krassimir (Joseph) Yankulov**
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**Wei Zhang**
BSc Beijing, MA York, PhD Toronto - Assistant Professor

**Associated Graduate Faculty**

**Hany Anany**
BSc MSc Cairo, PhD Guelph - Research Scientist AAFC

**Marc Aucoin**
BASc, MSc Waterloo, PhD Montreal - Associate Professor, Chemistry, University of Waterloo

**Anthony J. Clarke**
BSc, MSc, PhD Waterloo - Professor

**George Harauz**
BASc, MSc, PhD Toronto - Professor

**Peter J. Krell**
BSc, MSc Carleton, PhD Dalhousie - Professor Emeritus, Molecular and Cellular Biology, University of Guelph

**Joseph S.L. Lam**
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**Roselynn M.W. Stevenson**
BSc, PhD Manitoba - Professor Emeritus, Molecular and Cellular Biology, University of Guelph

**Melanie Wills**
BSc, PhD Guelph - Director G. Magnotta Lyme Disease Research Lab, University of Guelph

**Janet M. Wood**
BSc Guelph - Associate Professor Emeritus, Molecular and Cellular Biology, University of Guelph
**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 their 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

**Program 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 course 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 inquiry 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 their 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.

**Program 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 inquiry 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 One Health, 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 |

<p>| 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 |</p>
<table>
<thead>
<tr>
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<td>MCB*6500</td>
<td>MSc Research Topics in Molecular and Cellular Biology U [1.00]</td>
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<td>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.</td>
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<td>Department(s): Department of Molecular and Cellular Biology</td>
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<tr>
<td>MCB*7500</td>
<td>PhD Research Topics in Molecular and Cellular Biology U [1.00]</td>
<td></td>
</tr>
<tr>
<td></td>
<td>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.</td>
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<tr>
<td>BINF*6110</td>
<td>Genomic Methods for Bioinformatics</td>
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<tr>
<td>BIOT*6500</td>
<td>Molecular Biotechnology</td>
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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.

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**Janet Reeler-Marfisi**
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**Dorothée Bienzle**
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**Patrick Boerlin**
DVM, PhD Bern - Associate Professor

**Byram Bridle**
BSc, MSc, PhD Guelph - Associate Professor

**Jeff Caswell**
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**Robert A. Foster**
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DVM Cluj Napoca, MSc Cluj Napoca and Guelph, PhD Guelph - Lead Veterinarian Poultry Diseases, OMAFRA, 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 prepare 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 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.
Program 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.

Program 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 issues new sets of selected areas of study by the end of the biomedical science program. 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 coursework 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.

Program 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

One Health

The Department of Pathobiology participates in the collaborative specialization in One Health. Master's and Doctoral students wishing to undertake thesis research or their major research paper/project with an emphasis on one health are eligible to apply to register concurrently in Pathobiology and the collaborative specialization. Students should consult the One Health listing for more information.

Toxicology

The Department of Pathobiology participates in the masters 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 masters 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.

Program 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

<table>
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<tr>
<th>Course Code</th>
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<th>Credits</th>
<th>Description</th>
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<tr>
<td>PABI*6430</td>
<td>Applied and Professional Skills in Pathobiology S,F</td>
<td>[0.00]</td>
<td>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.</td>
</tr>
<tr>
<td>PABI*6440</td>
<td>MSc Seminar in Pathobiology S,F,W</td>
<td>[0.50]</td>
<td>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 the thesis plan presentations.</td>
</tr>
<tr>
<td>PABI*6450</td>
<td>Doctoral Seminar in Pathobiology S,F,W</td>
<td>[0.50]</td>
<td>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.</td>
</tr>
<tr>
<td>PABI*6630</td>
<td>Applied Comparative Pathology I U</td>
<td>[0.50]</td>
<td>Examination and interpretation of gross and microscopic lesions of domestic poultry. In-depth 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.</td>
</tr>
<tr>
<td>PABI*6640</td>
<td>Applied Comparative Pathology II U</td>
<td>[0.50]</td>
<td>A continuation of PABI*6630, emphasizing seasonal differences in diseases as well as diseases more commonly associated with winter conditions.</td>
</tr>
<tr>
<td>PABI*6650</td>
<td>Applied Comparative Pathology III U</td>
<td>[0.50]</td>
<td>Advanced course in the diagnostic pathology of mammals, birds, reptiles, amphibians, and fish. Cases may be restricted by animal taxon 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.</td>
</tr>
<tr>
<td>PABI*6720</td>
<td>Applied Laboratory Animal Science II U</td>
<td>[0.50]</td>
<td>Continuation of I with emphasis on biohazard and personnel safety, monitoring for disease, quality control and diagnostic procedures.</td>
</tr>
<tr>
<td>PABI*6730</td>
<td>Applied Laboratory Animal Science III U</td>
<td>[0.50]</td>
<td>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.</td>
</tr>
<tr>
<td>PABI*6740</td>
<td>Avian Diseases U</td>
<td>[0.50]</td>
<td>Pathological changes associated with diseases of poultry and pet birds, fish and various laboratory animals.</td>
</tr>
<tr>
<td>PABI*6750</td>
<td>Applied Laboratory Animal Science I U</td>
<td>[0.50]</td>
<td>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 care management.</td>
</tr>
<tr>
<td>PABI*6760</td>
<td>Special Topics in Pathobiology F,W,S</td>
<td>[0.50]</td>
<td>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.</td>
</tr>
<tr>
<td>PABI*6770</td>
<td>Laboratory Animal Science U</td>
<td>[0.50]</td>
<td>Detailed study of recent concepts of preventive medicine, diagnosis and therapeutics as applied to clinical recognition and control of avian diseases.</td>
</tr>
<tr>
<td>PABI*6650</td>
<td>Doctoral Seminar in Pathobiology S,F,W</td>
<td>[0.50]</td>
<td>Intermediate course in the diagnostic pathology of mammals, birds, reptiles, amphibians, and fish. Cases may be restricted by animal taxon 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.</td>
</tr>
</tbody>
</table>

#### Comparative Pathology

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PABI*6190</td>
<td>Topics in Immunology W</td>
<td>[0.50]</td>
<td>Examination and interpretation of gross and microscopic lesions of domestic poultry. In-depth 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.</td>
</tr>
<tr>
<td>PABI*6221</td>
<td>Comparative Veterinary Pathology I U</td>
<td>[0.50]</td>
<td>Pathological changes associated with diseases of amphibia, reptiles, wild and captive non-domestic birds, and wild mammals including fur-bearers.</td>
</tr>
<tr>
<td>PABI*6222</td>
<td>Comparative Veterinary Pathology II U</td>
<td>[0.50]</td>
<td>Pathological changes associated with diseases of poultry and pet birds, fish and various laboratory animals.</td>
</tr>
</tbody>
</table>

#### Immunology

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PABI*6100</td>
<td>Immunobiology F</td>
<td>[0.50]</td>
<td>Major areas of immunology, including initiation, regulation, receptors, genetics, immune system development and function.</td>
</tr>
<tr>
<td>PABI*6190</td>
<td>Topics in Immunology W</td>
<td>[0.50]</td>
<td>Aspects of immune and non-specific host resistance, diagnostic immunology and immune-mediated disease.</td>
</tr>
</tbody>
</table>
### 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 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 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.

*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.

Graduate Faculty
Andrew Bailey
BA, MA Oxford, PhD Calgary - Associate Professor
Samantha Brennan
BA Dalhousie, PhD Chicago - Professor and Dean, College of Arts
Donald Dedrick
BA, MA Carleton, PhD Toronto - Associate Professor
Monique Deveaux
BA, MA McGill, MPhil, PhD Cambridge - Professor and Canada Research Chair
Peter Eardley
BA McGill, MA, PhD Toronto - Associate Professor
Karyn L. Freedman
BA, MA Manitoba, PhD Toronto - Associate Professor
Maya Goldenberg
BA Toronto, MA McGill, PhD Michigan State - Associate Professor
John Hacker-Wright
BA Bradley, MA, PhD New York - Associate Professor
Karen L. Houle
BSc, MA, PhD Guelph - Professor
Stefan Lingquist
BSc Simon Fraser, MSc New York, PhD Duke - Associate Professor
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
BSc Toronto, MA, PhD California (San Diego) - Associate Professor
Karen Wendling
BA Michigan State, MA, PhD Toronto - Associate Professor

Administered Faculty
Ken Dorner
BA Queen’s, MA, PhD Pennsylvania - Professor Emeritus, Philosophy, University of Guelph
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.

Program 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.

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

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)

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. Students 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.

One Health
The Department of Philosophy participates in the collaborative specialization in One Health. Master’s and Doctoral students wishing to undertake thesis research or their major research paper/project with an emphasis on one health are eligible to apply to register concurrently in Philosophy and the collaborative specialization. Students should consult the One Health listing for more information.

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

PHIL *6000 Value Theory U (0.50)
A critical examination of some selected contemporary works in value theory or aesthetics.
Department(s): Department of Philosophy
PHIL*6060 Logic U [0.50]
A course designed to bring the individual student to the level of competence in logical
techniques and theory required for graduate studies.
Department(s): 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 problems in biomedical
care.
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]
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*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 first year
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
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 https://www.physics.uoguelph.ca/graduate-studies/graduate-studies-in-physics/how-to-apply. 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.

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Melanie Campbell (Waterloo - (519) 888-4567, Ext. 36273)
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Associate Director of the Institute
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Graduate Faculty

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Ralf Gellert
Dipl Phys, PhD Darmstadt - Associate Professor

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De-Tong Jiang
BSc Jilin, PhD Simon Fraser - Associate Professor

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Vladimir Ladizhansky
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Daniel Siegel
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Carl E. Svensson
BSc, PhD McMaster - Professor

Robert Wickham
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Martin Williams
PhD Imperial College, London - Associate Professor and Undergraduate Coordinator/Academic Counsellor, and Associate Chair (Undergraduate)

Huan Yang
BSc California Institute of Technology, PhD California Institute of Technology - Assistant Professor

Associated Graduate Faculty

Lilianna Caballero
BSc Universidad Nacional de Colombia, PhD Indiana University - Contractually Limited Faculty, Department of Physics, University of Guelph

Graduate Faculty from the University of Waterloo

Nasser Abukhdeir
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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
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Jonathan Baugh
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Kostadinka Bizheva
BS, MS Plovdiv, MS, PhD Tufts - Associate Professor

Avery Broderick
BS Stoney Brook, PhD CalTech - Associate Professor

Raffi Budakian
BS UCLA, MS, PhD Tufts - Associate Professor

Anton Burkov
BS, MS Plovdiv, MS, PhD Tufts - Associate Professor and Associate Graduate Officer

Melanie C. Campbell
BSc Toronto, MSc Waterloo, PhD Australian National, FAAO - Professor and Director Graduate Studies in Physics, University of Waterloo, University of Guelph

Z.Y. ‘Jeff’ Chen
BSc Fudan, PhD Maryland - Professor and University Research Chair

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, 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
BSc, MS Korea, PhD Maryland - Professor
David G. Hawthorn  
BSc McMaster, PhD Toronto - Associate Professor

Thorsten Hessjedal  
BSc Universität Stuttgart, MSc Eberhard-Karls-Universität Tübingen, PhD Humboldt Universität - Associate Professor

Robert Hill  
BSc, PhD Bristol - Associate Professor and Associate Dean of Science, Graduate Studies

Michael Hudson  
BSc Montreal, PhD Cambridge - Professor

Rajibul Islam  
BSc Jadavpur University, MSc Tata Institute of Fundamental Research, PhD University of Maryland - Assistant Professor

Thomas Jennewein  
MSc Innsbruck, PhD Vienna - Associate Professor

Achim Kempf  
BSc Heidelberg, PhD Munich - Professor and Canada Research Chair in the Physics of Information

Na Young Kim  
BS Seoul National University, PhD Stanford University - Associate Professor

Jan Kycia  
BSc McGill, MSc Pennsylvania, PhD Northwestern - Professor

Raymond Laflamme  
BSc Laval, PhD Cambridge - Professor and Canada Research Chair

Vasudevan Lakshminarayanan  
BSc, MSc University of Madras, PhD UC Berkeley - Professor

Zoya Leonenko  
MSc, PhD Novosibirsk - Professor

Tong K. Leung  
BSc, PhD British Columbia - Associate Professor

Qing-Bin Lu  
BSc, MSc Fuzhou, China, PhD Newcastle - Professor

Adrian Lupascu  
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Norbert Lütkenhaus  
MSc München, PhD Scotland, Habilitation Germany - Professor

Robert B. Mann  
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Matteo Mariantoni  
MSc Chandlers University of Technology, PhD Technical University of Munich - Assistant Professor

James Martin  
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Eduardo Martin-Martinez  
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Roger Melko  
BSc, MSc Waterloo, MA, PhD UC Santa Barbara - Associate Professor and Canada Research Chair in Computational Many-Body Physics

Guo-Xing Miao  
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Zoran Miskovic  
PhD University of Belgrade - Professor

Ruxandra Moraru  
- Associate Professor

Michele Mosca  
BMW Waterloo, MSc, DPhil Oxford - Professor

Christine Muschik  
BSc, MSc, PhD Ludwig-Maximilians-Universität - Assistant Professor

Linda F. Nazar  
BSc British Columbia, PhD Toronto - Professor

Will Percival  
BSc, PhD Oxford - Assistant Professor

Kevin Resch  
BSc Queen's, MSc, PhD Toronto - Professor

Pierre-Nicholas Roy  
BSc McGill, MSc 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 online application methods described on the web-site https://www.physics.uoguelph.ca/graduate-studies/graduate-studies-in-physics/how-to-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 https://www.physics.uoguelph.ca/graduate-studies/graduate-studies-in-physics/how-to-apply).

Program 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 coordinating 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, they 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 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 project is recommended for those planning careers requiring a broad non-specialized knowledge of physics (for example, high school teaching).

PhD Program

The Physics 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

There are three pathways for admission to the PhD program:

1. An 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). Students should consult the Biophysics listing for a detailed description of the graduate programs offered.
2. Students with an undergraduate degree in Physics may apply for admission directly to the PhD program. Successful applicants will have an outstanding academic record, breadth of knowledge in physics, previous research experience, and strong letters of recommendation.
3. Students wishing to be considered for transfer to a PhD program prior to completion of the MSc program must request the transfer up to 3 full-time terms after initial registration and have an excellent academic record as well as a strong aptitude for research.

Program Requirements

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 by the completion of the first year of the PhD program.

Two-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 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, they may be required to withdraw from the program.

Students who transfer to the PhD, or who enter the PhD directly, will need to complete the course work requirements of both the MSc and PhD degrees, a total of six one-term graduate courses. Three of the core courses including one of Physics 7010, Physics 7040 or Physics 7060 will have been taken by the end of the first year of the PhD program.

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 as and as requested.

Perimeter Scholars' Institute Courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Credit</th>
<th>Department</th>
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<tbody>
<tr>
<td>PHYS*6010</td>
<td>PSI Quantum Field Theory I U</td>
<td>0.50</td>
<td>Department of Physics</td>
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<th>Course Code</th>
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<tbody>
<tr>
<td>PHYS*6020</td>
<td>PSI Statistical Physics U</td>
<td>0.50</td>
<td>Department of Physics</td>
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<tbody>
<tr>
<td>PHYS*6030</td>
<td>PSI Quantum Field Theory II U</td>
<td>0.50</td>
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Feynman Path Integral, abelian and nonabelian gauge theories and their quantization, spontaneous symmetry breaking, nonperturbative techniques: lattice field theory, Wilsonian renormalization.

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<tbody>
<tr>
<td>PHYS*6040</td>
<td>PSI Relativity U</td>
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Special relativity, foundations of general relativity, Riemannian geometry, Einstein's equations, FRW and Schwarzschild geometries and their properties.

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<tr>
<td>PHYS*6050</td>
<td>PSI Quantum Theory U</td>
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<tbody>
<tr>
<td>PHYS*6060</td>
<td>PSI Information and Data Analysis U</td>
<td>0.50</td>
<td>Department of Physics</td>
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Probability, entropy, Bayesian inference and information theory. Maximum likelihood methods, common probability distributions, applications to real data including Monte Carlo methods.

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<tbody>
<tr>
<td>PHYS*6070</td>
<td>PSI Dynamical Systems U</td>
<td>0.50</td>
<td>Department of Physics</td>
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Maps, flows, stability, fixed points, attractors, chaos, bifurcations, ergodicity, approach to chaos. Hamiltonian systems, Liouville, measure, Poincare theorem, integrable systems with examples.

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<tbody>
<tr>
<td>PHYS*6080</td>
<td>PSI Computation U</td>
<td>0.50</td>
<td>Department of Physics</td>
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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 programing.

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<tbody>
<tr>
<td>PHYS*6210</td>
<td>PSI Cosmology U</td>
<td>0.25</td>
<td>Department of Physics</td>
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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, inlation and observational tests.

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<tbody>
<tr>
<td>PHYS*6220</td>
<td>PSI Standard Model U</td>
<td>0.25</td>
<td>Department of Physics</td>
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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.

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<tr>
<td>PHYS*6230</td>
<td>PSI String Theory U</td>
<td>0.25</td>
<td>Department of Physics</td>
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</table>

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.

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<tbody>
<tr>
<td>PHYS*6240</td>
<td>PSI Mathematical Physics Topics U</td>
<td>0.25</td>
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Differential forms, de Rham cohomology, differential topology and characteristic classes, monopoles and instantons, Kahler manifolds, Dirac equations, zero modes and index theorems.

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<tbody>
<tr>
<td>PHYS*6350</td>
<td>PSI Quantum Information Review U</td>
<td>0.25</td>
<td>Department of Physics</td>
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</table>

Review of selected topics in Quantum Information.

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<tbody>
<tr>
<td>PHYS*6360</td>
<td>PSI Gravitational Physics Review U</td>
<td>0.25</td>
<td>Department of Physics</td>
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</table>

Review of selected topics in Gravitational Physics.

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<tbody>
<tr>
<td>PHYS*6370</td>
<td>PSI Condensed Matter Theory U</td>
<td>0.25</td>
<td>Department of Physics</td>
</tr>
</tbody>
</table>

Review of selected topics in Condensed Matter Theory.
PHYS*6380 PSI Quantum Gravity U [0.25]
Review of selected topics in Quantum Gravitiy.
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

PHYS*7010 Quantum Mechanics I * U [0.50]
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]
Department(s): Department of Physics

PHYS*7090 Green's Function Method U [0.50]
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. Iospin, 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]
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]
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. Offered in conjunction with PHYS*4070. Extra work is required of graduate students.

*Restriction(s):* 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 Pockel'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, nose 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 environmentally 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 biomass and biocomposites.

**Administrative Staff**

- **Chair**
  - Hugh Earl (314 Crop Science Building, Ext. 58568)
  - hjearl@uoguelph.ca

- **Graduate Program Coordinator**
  - Istvan Rajcan (317 Crop Science Building, Ext. 53564)
  - irajcan@uoguelph.ca

- **Associate Graduate Program Coordinator**
  - Max Jones (4221 Bovey Building, Ext. 53016)
  - amjones@uoguelph.ca

- **Graduate Program Assistant**
  - Tara Israel (1103 Bovey Building, Ext. 56077)
  - pagrad@uoguelph.ca

**Graduate Faculty**

- GS Bozzo
  - BSc, MSc York, PhD Queen's - Associate Professor and Associate Graduate Program Coordinator John A. Cline

- John A. Cline
  - BSc Guelph, MSc Michigan State, PhD London UK - Associate Professor

- William Deen
  - BSc, MSc Guelph - Associate Professor

- Hugh J. Earl
  - BSc, MSc Guelph, PhD Western Ontario - Associate Professor and Chair

- Mehrzad Eskandari
  - BSc, Arsenian Azad Univ., MSc, Karaj Azad Univ., PhD Guelph - Assistant Professor

- Christopher L. Gillard
  - BSc, MSc, Guelph - Associate Professor

- Bernard Grodzinski
  - BSc Toronto, MSc, PhD York, MA Cambridge - Professor

- David C. Hooker
  - BSc Agr, MSc, PhD Guelph - Associate Professor

- A. Maxwell P. Jones
  - BSc, MSc Guelph, PhD British Columbia - Assistant Professor

- Katerina S. Jordan
  - BS, MS Maryland, PhD Rhode Island - Associate Professor

- Elizabeth A. Lee
  - BSc Minnesota, MSc Iowa State, PhD Missouri - Professor

- Lewis N. Lukens
  - BSc Carleton College, PhD Minnesota - Associate Professor

- Eric M. Lyons
  - BSc Northern Iowa, PhD Pennsylvania State - Associate Professor

- Ralph C. Martin
  - BA, MSc Carleton, PhD McGill - Professor

- Mary Ruth McDonald
  - BSc, MSc, PhD Guelph - Professor

- Barry J. Micalef
  - BSc, MSc Guelph, PhD Wisconsin-Madison - Associate Professor and Associate Department Chair

- Amar K. Mohanty
  - BSc, MSc, PhD UKtal - Professor and Premier’s Research Chair in Biomaterials & Transportation

- Joshua Nasielski
  - BSc, MSc, PhD Guelph - Assistant Professor

- Gopinadhan Paliyath
  - BScEd Mysore, MSc Calicut, PhD Indian Institute of Science - Professor

- K. Peter Pauls
  - BSc, MSc, PhD Waterloo - Professor

- Manish N. Raiizada
  - BSc Western, PhD Stanford - Professor

- Istvan Rajcan
  - BSc Novi Sad, Yugoslavia, PhD Guelph - Professor and Graduate Program Coordinator

- Darren E. Robinson
  - BSc Winnipeg, MSc Manitoba, PhD Guelph - Associate Professor

- Praveen K. Saxena
  - BSc Meerut, MSc Lucknow, PhD Delhi - Professor

- Arthur W. Schaalma
  - BSc, MSc, PhD Guelph - Professor

- Peter H. Sikkema
  - BSc, MSc Guelph, PhD Western Ontario - Professor

- Jayasankar Subramanian
  - BSc, MSc TamilNadu Agricultural (India), PhD Florida - Professor

- John Sulik
  - BSc, MS, PhD Florida State - Assistant Professor

- Francois Tardif
  - BSc, MSc, PhD Laval - Professor

- Cheryl Trueman
  - BSc, MSc, PhD Guelph - Assistant Professor

- Rene C. Van Acker
  - BSc, MSc Guelph, PhD Reading - Professor and Associate Dean, OAC

- David J. Wolyn
  - BSc Rutgers, MS, PhD Wisconsin - Professor

**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
  - BSc Queen’s, MSc Guelph, PhD McGill - Senior Research Scientist, Agriculture & Agri-Food Canada, Ottawa

- Qiang Liu
  - BEng, MEng East China, PhD Laval - Research Scientist, Agriculture & Agri-Food Canada, Guelph

- Sean Myles
  - BA Saint Thomas, MSc Oxford, PhD Max Planck - Assistant Professor, Animal Sciences, Dalhousie University

- Steven Schnebel
  - BS Agronomy, MSc, PhD Iowa State - Senior Research Scientist, Pioneer Hi-Bred International

- Barry Shelp
  - BSc, MSc Brock, PhD Queen’s - Retired Faculty, Plant Agriculture, University of Guelph

- 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.

Program 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.

Program 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 masters/doktoral collaborative specialization in toxicology. Please consult the Toxicology listing for a detailed description of the masters/doktoral collaborative specialization.
### PLNT*6140 Biological and Cultural Control of Plant Diseases W [0.50]
This course explores current concepts and approaches to managing pathogens and diseases in detail but other methods (e.g. genetic resistance) will be presented as well. Offered in conjunction with PBIO*4070. Extra work is required of graduate students.

**Offering(s):** Offered Annually  
**Restriction(s):** Credit may be obtained for only one of PBIO*4070 or PLNT*6140  
**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*6140 Biological and Cultural Control of Plant Diseases W [0.50]
This course explores current concepts and approaches to managing pathogens and diseases in detail but other methods (e.g. genetic resistance) will be presented as well. Offered in conjunction with PBIO*4070. Extra work is required of graduate students.

**Offering(s):** Offered Annually  
**Restriction(s):** Credit may be obtained for only one of PBIO*4070 or PLNT*6140  
**Department(s):** Department of Plant Agriculture

#### 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*6380 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

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**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 experimental design and statistical principles, the design of experiments, the testing of hypotheses, and communication of findings to other disciplines.

**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 the following fields:

- Rights, Justice, Citizenship, and Identity (MA)
- Canadian Politics (PhD)
- Comparative Politics (PhD)
- Gender, Race, Indigeneity, and Sexuality (PhD)
- International Relations (PhD)
- Law and Politics (PhD)
- Public Policy and Governance (PhD)

Administrative Staff

Chair
Troy Riddell (513 MacKinnon, Ext. 56503)
ritt@uoguelph.ca

Graduate Program Coordinator
Candace Johnson (511 MacKinnon, Ext. 52179)
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Graduate Program Assistant
Renee Tavasci (527 MacKinnon, Ext. 56973)
rivasac@uoguelph.ca

Graduate Faculty

Dennis Baker
BA McMaster, LLB Toronto, PhD Calgary - Associate Professor

Ryan C. Briggs
BSS, Ottawa, PhD American University - Assistant Professor

Janine Clark
BES Waterloo, MA Carleton, PhD Toronto - Professor

Carol L. Dauda
BA McMaster, MA Guelph, PhD Toronto - Associate Professor

Jordi Diez
BA Toronto, MA Essex, PhD Toronto - Professor

Carmen Ho
BA Western, MSc London, PhD Toronto - Assistant Professor

Candace Johnson
BA Toronto, MA, PhD Dalhousie - Professor and Graduate Program Coordinator

Craig A. Johnson
BA Queen's, MA Toronto, PhD London School of Economics - Professor

Edward Koning
BA, MA Leiden, PhD Queen's - Associate Professor

Theresa M.L. Lee
BA Toronto, MA, PhD Princeton - Associate Professor

Leah Levac
BA Acadia, MA, PhD New Brunswick - Associate Professor

David MacDonald
BA Carleton, MA Ottawa, PhD London School of Economics - Professor

Tim A. Mau
BA, MA Guelph, PhD Oxford - Associate Professor

Andrea Paras
BA UBC, MA, PhD Toronto - Associate Professor

Kate Puddister
BA, MA Guelph, PhD McGill - Assistant Professor

Troy Riddell
BA, MA Calgary, PhD McGill - Associate Professor and Chair

Byron M. Sheldrick
BA Carleton, LLB Toronto, MA, PhD York - Professor

Julie Simmons
BA British Columbia, MA, PhD Toronto - Associate Professor

Tamara Small
BA Guelph, MA Calgary, PhD Queen's - Assistant Professor

Ian S. Spears
BA Toronto, MA Queen's, PhD McGill - Associate Professor

Adam Sneyd
BA Queen's, MA York, PhD McMaster - Associate Professor

Dave Snow
BA St. Thomas, MA, PhD Calgary - Assistant Professor

Deborah Stienstra
BA Alberta, MA, PhD York - Professor and Jarislowsky Chair in Families and Work

MA Program

The MA program revolves around the field of Rights, Justice, Citizenship, and Identity while allowing flexibility for students to pursue their various interests. Within the broader framework of Rights, Justice, Citizenship and Identity, the Department has particular strengths in Public Policy and Administration and Global Justice and Politics and offers a number of courses related to those topics.

Our broad range of course offerings and routes to complete the degree allow students to tailor their experience towards their future employment or academic goals. Graduates of the program are engaged in a wide range of careers with academic institutions, government and public sector agencies, non-governmental organizations, and industry.

Application Procedure

Program offices should be consulted for admission deadlines and required documents [http://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*6560, 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.

Program Requirements

Students enroll in one of three study options: 1) course work only, 2) course work and major research paper or 3) course work and thesis.

Thesis

In order to satisfy the degree requirements, the student will complete three courses plus the Communications seminar (POLS*6900), the Research Design and Methods course (POLS*6940) and complete a Thesis.

Three courses with at least two of them from the following core courses:

<table>
<thead>
<tr>
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<th>Credits</th>
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<tbody>
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<tbody>
<tr>
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<td>0.25</td>
</tr>
<tr>
<td>POLS*6940</td>
<td>Research Design and Methods</td>
<td>0.75</td>
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or an approved equivalent from another department

A thesis of approximately 10,000 to 15,000 words (approximately 80 to 100 double-spaced pages). The written thesis is defended in an oral examination.

Course Work and Major Research Paper

In order to satisfy the degree requirements, the student will complete four courses plus the Research Design and Methods course POLS*6940, a Communications seminar POLS*6900, a total of six courses and complete the Major Research Paper POLS*6970.

Four courses with at least two of them from the following core courses:

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<td>Research Design and Methods</td>
<td>0.75</td>
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</table>

or an approved equivalent from another department

POLS*6970 (1.00) Major Paper

The research paper is approximately 10,000 to 12,500 words (approximately 40 to 50 double-spaced pages).

Course Work

In order to satisfy the degree requirements, the student will complete the Research Methods course POLS*6940 and the Communications seminar POLS*6900, plus five additional courses.

Five courses with at least three of them from the following core courses:

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<td>Development and Global Justice</td>
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</table>
PhD Program

The PhD program offers students the opportunity to pursue studies in six fields: 1) Canadian Politics; 2) Comparative politics; 3) Gender, Race, Indigeneity, and Sexuality; 4) International Relations; 5) Law and Politics; and 6) Public Policy and Governance. Students are required to major in one field and minor in the other. The Department has wide-ranging and various expertise in each of the fields—please consult the Department’s website for more information.

The PhD program is designed both for students interested in pursuing academic positions and also for students interested in working in research capacities in the public, non-profit or private sectors.

Application Procedure

Graduate students are admitted each Fall semester. Program offers should be consulted for admission deadlines and required documents. Students must be admitted to a MA in Political Science other than Political Science, are encouraged to apply on the condition that they take additional courses upon their entry into the program.

Program 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 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.

Program Requirements

Students will be required to successfully complete a minimum of six graduate courses:

- Two PhD field courses (see Department’s Graduate Handbook). One course in the student’s major field and one course in the minor field (selected in consultation with the student’s advisor).
- Two research methods courses:
  - POLS*6940 [0.75] Research Design and Methods
  - POLS*6500 [0.50] Qualitative and Quantitative Data Analysis
- Two elective courses
- 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 double-spaced 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.

One Health

The Department of Political Science participates in the collaborative specialization in One Health. Master’s and Doctoral students wishing to undertake thesis research or their major research paper/project with an emphasis on one health are eligible to apply to register concurrently in Political Science and the collaborative specialization. Students should consult the One Health listing for more information.

Courses

Note

A number of graduate courses are cross-listed with intensive, senior undergraduate seminars. In these cross-listed offerings, which are identified as such in the course descriptions below, course and grading expectations will be tailored to graduate students.

POLS*6050 The Politics of Identity U [0.50]

This course engages theoretical approaches of identity and identity politics in the global north and/or south. Topics may include contestation over indigenous, racial, ethnic, cultural, sexual, gender, and women’s rights.

Department(s): Department of Political Science

POLS*6120 Theories of International Relations U [0.50]

This course examines Western and non-Western theories of international relations, such as realism, liberalism, and constructivism, as well as Marxist, critical, indigenous and gender approaches. It will engage with established and emerging theories, exploring contestation and debates within the discipline.

Department(s): Department of Political Science

POLS*6130 Rights and Public Policy U [0.50]

Students will study how individual rights can be restricted, protected or expanded through public policy, and how rights considerations and discourse may shape policy and the policy process.

Department(s): Department of Political Science

POLS*6150 Constitutionalism and Judicial Politics U [0.50]

This course investigates how the constitution and the judiciary affect political processes and decision-making, and how politics shape constitutions and judicial process. Canadian or comparative examples will be examined.

Department(s): Department of Political Science

POLS*6160 Multi-Level Governance in Canada U [0.50]

This course considers the evolving relationship among levels of government in Canada. The growth of cities, the growth of policy responsibilities of provinces, the influence of international organizations, and the development of First Nations government in Canada all challenge the conventional study of federal-provincial relations in Canada. From year to year, this course examines one or several of these contemporary dynamics. Offered in conjunction with POLS*4160. Extra work is required for graduate students.

Department(s): Department of Political Science

POLS*6170 Courts and Parliament U [0.50]

The course critically examines the complex relationship between the judiciary and representative institutions. By comparing the treatment of current political controversies (assisted suicide, prostitution, drug treatment), students will better appreciate the often-subtle exchanges between the two institutions and further enhance their research abilities in regards to both legal and legislative processes. Offered in conjunction with POLS*4070. Extra work is required for graduate students.

Department(s): Department of Political Science

POLS*6180 Women, Justice and Public Policy U [0.50]

This course will use gender-based analysis in examining a series of justice and public policy issues affecting the lives of women, including equality rights, pay and employment equity, domestic violence, sexual assault, family policy, health care policy, and pornography. Offered in conjunction with POLS*4100. Extra work is required for graduate students.

Department(s): Department of Political Science

POLS*6200 Law and Politics U [0.50]

This course explores advanced topics in law and politics depending on the interests of the instructor. Potential topics include investigating the law and politics of social change or analyzing debates about the political power of courts in Canada or in comparative perspectives. Offered in conjunction with POLS*4050. Extra work is required for graduate students.

Department(s): Department of Political Science
POLS*6210 Conceptions of Canada U [0.50]
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.
Department(s): Department of Political Science

POLS*6380 State-building and Regime Change U [0.50]
Students will explore theories of states, regimes, state-building, regime change, and democratization. The course critically engages dominant debates and reviews empirical examples.
Department(s): Department of Political Science

POLS*6390 Resource Scarcity and Conflict U [0.50]
This course examines domestic, international and global dimensions of environmental governance and resource conflict, as well as stakeholder perspectives on resource politics. Topics may include climate change; the resource curse; commodity production, trade and consumption; food and human security; political ecology and extractive industries.
Department(s): Department of Political Science

POLS*6400 Citizenship and Social Policy U [0.50]
Students will study citizenship and the allocation of social goods through social policies. Normative debates, theoretical frameworks, and empirical perspectives in a range of social policy fields – such as health care, pensions, childcare, education, and housing - may be examined.
Department(s): Department of Political Science

POLS*6500 Qualitative and Quantitative Data Analysis U [0.50]
This course introduces both qualitative and quantitative methods of data analysis. Students will engage theoretical material on the subject and develop data analysis skills through practice.
Department(s): Department of Political Science

POLS*6510 Political Participation and Engagement U [0.50]
Students will study how individual citizens engage in the political process. Informal channels such as social movements or more formal organizations such as interest groups and political parties may be examined.
Department(s): Department of Political Science

POLS*6520 International Political Economy U [0.50]
The course relies on theoretical approaches in IPE to examine relationships between politics and economics across national and regional levels. The evolution of the global political economy and its governance structures is explored, as well as contemporary debates about globalization and state and non-state actors’ responses. Issue-areas may include: money and power, technology, trade, development and the environment. Offered in conjunction with POLS*4200. Extra work is required for graduate students.
Restriction(s): Credit may be obtained for only one of POLS*4200 or POLS*6520
Department(s): Department of Political Science

POLS*6530 Human Rights, Ethics and Development U [0.50]
This course will examine the political and ethical consequences of adopting a human rights framework in national and international contexts by both state and non-state actors. This subject will be explored from a range of historical, theoretical and practical perspectives. Offered in conjunction with POLS*4300. Extra work is required for graduate students.
Restriction(s): Credit may be obtained for only one of POLS*4300 or POLS*6530
Department(s): Department of Political Science

POLS*6540 Topics in Comparative Politics U [0.50]
This course considers theories and problems in comparative politics and government in developing and industrialized countries. The geographical and theoretical focus of the course will reflect the interests of the instructor. Offered in conjunction with POLS*4710. Extra work is required for graduate students.
Restriction(s): Credit may be obtained for only one of POLS*4710 or POLS*6540
Department(s): Department of Political Science

POLS*6550 Topics in Public Management U [0.50]
This course will examine various topics related to governance, such as public management reform, public sector leadership, third sector organizations or budgeting and human resources. Offered in conjunction with POLS*4250. Extra work is required for graduate students.
Restriction(s): Credit may be obtained for only one of POLS*4250 or POLS*6550
Department(s): Department of Political Science

POLS*6560 Topics in Public Policy U [0.50]
This course will examine various public policy issues such as social policy or health care policy in a Canadian or comparative context. Offered in conjunction with POLS*4260. Extra work is required for graduate students.
Restriction(s): Credit may be obtained for only one of POLS*4260 or POLS*6560
Department(s): Department of Political Science

POLS*6570 International Relations of the Middle East U [0.50]
This course is designed as an advanced introduction to the international relations of the Middle East. The course focuses on theories of international relations and their applicability to specific case studies of Middle Eastern politics. The course provides a critical examination of conflicts in the region, and contextualizes those conflicts within both realist and neo-realist theories of international relations. Offered in conjunction with POLS*4730. Extra work is required for graduate students.
Restriction(s): Credit may be obtained for only one of POLS*4730 or POLS*6570
Department(s): Department of Political Science

POLS*6580 Topics in International Relations U [0.50]
This course considers theories and problems in the field of International Relations. The theoretical and/or geographical focus of the course will reflect the interests of the instructor. Offered in conjunction with POLS*4720. Extra work is required for graduate students.
Restriction(s): Credit may be obtained for only one of POLS*4720 or POLS*6580
Department(s): Department of Political Science

POLS*6590 Advanced Topics in Rights and Liberties U [0.50]
The course explores rights and liberties from various perspectives depending on the interests of the instructor. Potential topics include exploring the political, social, and legal factors and theories that explain the development of rights and liberties; rights and liberties in a comparative and international context; or the philosophical and policy debates surrounding rights and liberties. Offered in conjunction with POLS*4740. Extra work is required for graduate students.
Restriction(s): Credit may be obtained for only one of POLS*4720 or POLS*6580
Department(s): 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*6670 Development and Global Justice U [0.50]
Students will study Western and non-Western theoretical perspectives on the politics of development and global justice. Topics may include human rights and development, global inequality, environmental justice, indigenous politics, humanitarian ethics, intercultural competency, and faith-based development.
Department(s): Department of Political Science

POLS*6820 PhD Canadian Politics U [0.50]
Students will help to identify and critically engage with key scholarship in the field of Canadian Politics. The course will provide a breadth of understanding of the field, but a portion of the Canadian reading list can be tailored to the student’s particular interests.
Department(s): Department of Political Science

POLS*6830 PhD Field Course in Comparative Politics U [0.50]
Students will help to identify and critically engage with key scholarship in the field of Comparative Politics. The course will provide a breadth of understanding of the field, but a portion of the reading list can be tailored to the student’s particular interests.
Department(s): Department of Political Science

POLS*6840 PhD Field Course in Gender, Race, Indigeneity, and Sexuality U [0.50]
Students will help to identify and critically engage with key scholarship relating to Gender, Race, Indigeneity and Sexuality. The course will provide a breadth of understanding of the field, but a portion of the reading list can be tailored to the student’s particular interests.
Department(s): Department of Political Science
POLS*6850 PhD Field Course in International Relations U [0.50]
Students will help to identify and critically engage with key scholarship relating to International Relations. The course will provide a breadth of understanding of the field, but a portion of the reading list can be tailored to the student's particular interests.
Department(s): Department of Political Science

POLS*6860 PhD Field Course in Law and Politics U [0.50]
Students will help to identify and critically engage with key scholarship relating to Law and Politics. The course will provide a breadth of understanding of the field, but a portion of the reading list can be tailored to the student's particular interests.
Department(s): Department of Political Science

POLS*6870 PhD Field Course in Public Policy and Governance U [0.50]
Students will help to identify and critically engage with key scholarship relating to Public Policy and Governance. The course will provide a breadth of understanding of the field, but a portion of the reading list can be tailored to the student's particular interests.
Department(s): Department of Political Science

POLS*6900 Communications F-W [0.25]
This course trains students in crucial academic skills, in particular writing and presentation skills. Some course elements may be offered through workshops in conjunction with other units, such as the Learning Commons.
Department(s): Department of Political Science

POLS*6940 Research Design and Methods U [0.75]
This course focuses on the elements of designing and writing a research question and proposal. It examines the principles of research design and research ethics, and surveys the strengths and weaknesses of a variety of methods of data collection.
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.
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 (MSc, 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 DVMsc degrees.

Administrative Staff

Chair
Todd Duffield (2536 Stewart Bldg., Ext. 54057)
tduffield@uoguelph.ca

Graduate Program Coordinator, Admissions and Administration
David L. Pearl (Clinical Research Bldg. 207B OVC, Ext. 54748)
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Graduate Faculty

Cathy Bauman
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Olaf Berke
Dipl. Statistics, PhD Dortmund Germany - Associate Professor

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Katie Clow
BSc, DVM, PhD Guelph - Assistant Professor

Jason B. Cox
DVM, PhD Guelph - Associate Professor

Catherine E. Dewey
DVM, MSc, PhD Guelph - Professor and Chair

Todd F. Duffield
DVM, DVS Guelph - Professor

Robert M. Friendship
DVM, MSc Guelph, Dip ABVP - Professor

Cathy J. Gartley
BSc New Brunswick, DVM, DVS Guelph, Dip ACT - Assistant Professor

Jessica L. Gordon
BSc, MSc Michigan State Univ., DVS 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 E. Kelton
DVM, MSc, PhD Guelph, Dip ABVP - Professor

Deep K. Khosa
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BSc McGill, DVM, DVS Guelph - Associate Professor

Scott A. McEwen

DVM, DVS Guelph, Dip. ACVP - Professor

Jennifer McWhiter
BSc, PhD Waterloo - Assistant 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

Jane Parmley
DVM Saskatchewan, PhD Guelph - Associate Professor

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

David Renaud
BSc, DVM, PhD Guelph - Assistant 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

Colleen Best
BSc, DVM, PHD Guelph - Contractually Limited Faculty, Population Medicine, University of Guelph

Ashlee Cussono
BA, MSc, PhD Guelph - Director, Labrador Institute of Memorial University

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, DVS Guelph - Veterinary Epidemiologist, Public Health Agency of Canada

Karen Shapiro
BS, DVM, PHD, MPVM - Assistant Research Faculty, Pathology, University of California-Davis

Jeff Wilson
DVM, DVS, PhD Guelph - President, Novometrix Inc., Moffat

MSc Program

The department offers a MSc by thesis in the fields of: 1) epidemiology; 2) therio genology; 3) health management; and 4) public health, and a MSc by course work and major research paper in the fields of: 1) epidemiology; and 2) public health.

Admission Requirements

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 in Population Medicine in the fields of epidemiology or public health builds on knowledge of various analytic techniques, 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.

Program Requirements

Students enroll 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 in Public Health; students in health management and theriogenology must take either Epidemiology I (POPM*6200) or Applied Clinical Research (POPM*6320). 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
Epidemiology
For the MSc by course work and major research paper 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. Each student in the program will take three core courses (including the Project in Population Medicine 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 Population Medicine (Epidemiology) by course work and major research project will include:

**Core Courses**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>POPM*6200</td>
<td>Epidemiology I</td>
<td>0.50</td>
</tr>
<tr>
<td>POPM*6210</td>
<td>Epidemiology II</td>
<td>0.50</td>
</tr>
<tr>
<td>POPM*6250</td>
<td>Project in Population Medicine</td>
<td>1.00</td>
</tr>
</tbody>
</table>

**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 Epidemiology of Zoonoses
- POPM*6230 Applied Clinical Research
- POPM*6290 Epidemiology III
- POPM*6350 Safety of Foods of Animal Origins
- POPM*6950 Studies in Population Medicine
- STAT*6920 Topics in Statistics
- POPM*6520 Introduction to Epidemiological and Statistical Methods
- POPM*6700 Swine Health Management *
- POPM*6400 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 paper option; two of these semesters must be at the University of Guelph. Normally, however, students take 4-5 semesters to complete the program.

Public Health
For the MSc by course work and major research paper in the field of Public Health, no fewer than eight courses (at least 4.0 course credits) will be taken. These must be approved by the departmental Graduate Program Committee. Each student in the program will take three core courses (including the Project in Population Medicine 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 Population Medicine (Public Health) by course work and major research project will include:

**Core Courses**

<table>
<thead>
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</tr>
<tr>
<td>POPM*6250</td>
<td>Project in Population Medicine</td>
<td>1.00</td>
</tr>
</tbody>
</table>

**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*6500 Infectious Diseases and Public Health
- POPM*6210 Epidemiology II
- POPM*6290 Epidemiology III
- POPM*6510 Community Health Promotion
- POPM*6540 Concepts in Environmental Public Health
- POPM*6580 Public Health Administration
- POPM*6950 Studies in Population Medicine
- EDRR*6100 Disaster Planning and Management
- POPM*6520 Introduction to Epidemiological and Statistical Methods
- EDRR*6690 Program Evaluation
- POPM*6600 Dairy Health Research

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 paper 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.

**Program 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, PhD students who have taken the course or its equivalent previously as an MSc student will only be required to take the seminar course once. Students are also 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 defense 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 involved in 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.

One Health
The Department of Population Medicine participates in the collaborative specialization in One Health. Master’s and Doctoral students wishing to undertake thesis research or their major research paper/project with an emphasis on one health are eligible to apply to register concurrently in Population Medicine and the collaborative specialization. Students should consult the One Health listing for more information.

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 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.

*Restriction(s): MPH and Population medicine students. Instructor consent required.*

*Department(s): 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 analyzed 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 Population Medicine F,W,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 population medicine.

*Restriction(s): Restricted to coursework students in the MSc Population Medicine program.*

*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*

**POPM*6800 Infectious Disease Modeling W [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.

*Prerequisite(s): POPM*6200 and successful completion of an undergraduate course in differential calculus.*

*Restriction(s): Instructor consent required.*

*Department(s): Department of Population Medicine*

**POPM*6960 Systematic Reviews & Meta-Analysis W [0.50]**
This course covers the use of systematic reviews in animal and public health, the steps in conducting a systematic review, and quantitative synthesis of research results from multiple studies (meta-analysis). The course combines didactic lectures and videos with practical exercises during class time.

*Prerequisite(s): POPM*6200 and POPM*6520*

*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*

Theriogenology

**POPM*6610 Theriogenology 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 Theriogenology 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*
<table>
<thead>
<tr>
<th>Course Code</th>
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<th>Department(s)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>POPM*6650</td>
<td>Theriogenology of Dogs and Cats * U [0.50]</td>
<td>Department of Population Medicine</td>
<td>A seminar/lecture series that includes the theory and management of clinical reproduction for the dog and cat, including use of developing technologies.</td>
</tr>
<tr>
<td>POPM*6670</td>
<td>Theriogenology of Small Ruminants * U [0.50]</td>
<td>Department of Population Medicine</td>
<td>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.</td>
</tr>
<tr>
<td>POPM*6910</td>
<td>Seminar F [0.00]</td>
<td>Department of Population Medicine</td>
<td>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.</td>
</tr>
<tr>
<td>POPM*6950</td>
<td>Studies in Population Medicine U [0.50]</td>
<td>Department of Population Medicine</td>
<td>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.</td>
</tr>
<tr>
<td>POPM*6350</td>
<td>Safety of Foods of Animal Origins F [0.50]</td>
<td>Department of Population Medicine</td>
<td>The detection, epidemiology, human health risk, and control of hazards in food of animal origin.</td>
</tr>
<tr>
<td>POPM*6510</td>
<td>Community Health Promotion F [0.50]</td>
<td>Department of Population Medicine</td>
<td>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.</td>
</tr>
<tr>
<td>POPM*6530</td>
<td>Health Communication W [0.50]</td>
<td>Department of Population Medicine</td>
<td>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.</td>
</tr>
<tr>
<td>POPM*6540</td>
<td>Concepts in Environmental Public Health W [0.50]</td>
<td>Department of Population Medicine</td>
<td>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.</td>
</tr>
<tr>
<td>POPM*6560</td>
<td>Public Health Policy and Systems W [0.50]</td>
<td>Department of Population Medicine</td>
<td>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.</td>
</tr>
<tr>
<td>POPM*6570</td>
<td>Public Health Capstone F [0.00]</td>
<td>Department of Population Medicine</td>
<td>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.</td>
</tr>
<tr>
<td>POPM*6580</td>
<td>Public Health Administration F [0.50]</td>
<td>Department of Population Medicine</td>
<td>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.</td>
</tr>
<tr>
<td>POPM*6590</td>
<td>Public Health Practicum II W [1.00]</td>
<td>Department of Population Medicine</td>
<td>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.</td>
</tr>
<tr>
<td>POPM*6670</td>
<td>Theriogenology of Small Ruminants * U [0.50]</td>
<td>Department of Population Medicine</td>
<td>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.</td>
</tr>
<tr>
<td>POPM*6560</td>
<td>Theriogenology of Small Ruminants * U [0.50]</td>
<td>Department of Population Medicine</td>
<td>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.</td>
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<td>POPM*6560</td>
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</tr>
</tbody>
</table>
IX. Graduate Programs, Psychology

The Department of Psychology offers programs in four fields of psychology: 1) applied social psychology, 2) clinical child and adolescent psychology, 3) industrial/organizational psychology and 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 Child and Adolescent Psychology (MA, PhD)**
  The area of Clinical Child and Adolescent Psychology 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 contribute 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**

Ian Newby-Clark (4013 MacKinnon, Ext. 53517)
inewby@uoguelph.ca

**Associate Chair**

Daniel Meegan (3018 MacKinnon Ext, Ext. 54998)
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**Graduate Program Coordinator**

Lana Trick (4003 MacKinnon Ext, Ext. 53518)
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**Graduate Program Assistant**

Robin Sorbara (4014 MacKinnon, Ext. 53508)
robinfra@uoguelph.ca

### Faculty

**Graduate Faculty**

Naseem Al-Aidroos  
BSc Waterloo, MA, PhD Toronto - Associate 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 Choleres  
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

Mark J. Fenske  
BSc Lethbridge, MA, PhD Waterloo - Associate Professor

Christopher Fiacconi  
BSc Western, PhD McMaster - Assistant Professor

Benjamin Giguère  
BA McGill, MA, PhD York - Associate Professor

Harjinder Gill  
BA Waterloo, MA, PhD Western Ontario - Associate Professor

Gloria Gonzalez-Morales  
BA La Laguna, EPFL, PhD Valencia - Associate Professor

Peter A. Hausdorf  
BSc McMaster, MA Guelph, PhD McMaster - Associate Professor and Graduate Program Coordinator

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 and Director of Clinical Training

Harvey H.C. Marmurek  
BA Toronto, MA, PhD Ohio State - Professor

Kaitlyn McLachlan  
BA York, MA, PhD Simon Fraser - Assistant Professor

C. Meghan Murrary  
BA Laurier, PhD Dalhousie - Associate 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

Jennifer Murray  
BSc Nebraska-Kearney, MA, PhD Nebraska-Lincoln - Assistant Professor

Ian R. Newby-Clark  
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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 - Professor

Leanne S.M. Son Hing  
BA Queen’s, MA, PhD Waterloo - Associate Professor

Jeffrey Spence  
BA Laurier, MA, PhD Waterloo - Associate Professor

David Stanley  
BA Waterloo, MA, PhD Western Ontario - Associate Professor

Kristel Thomassin  
BA Waterloo, BSc, PhD Georgia - Assistant Professor

Lana M. Trick  
BSc Calgary, MA, PhD Western Ontario - Professor
Preparatory Course Work

Students will acquire knowledge and skills necessary to carry out Neuroscience and Applied Cognitive Science research in academic and/or applied settings. This will involve a course in Research Design and Statistics, a course in Discrete-variable Statistics 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.

Program Requirements

The program involves three components:

1. Preparatory Course Work: Students will acquire knowledge and skills necessary to carry our Neuroscience and Applied Cognitive Science research in academic and/or applied settings. This will involve a course in Research Design and Statistics, a course in Discrete-variable Statistics 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.

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.

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.

Program Requirements

The program involves three components:

1. Preparatory Course Work: Students will acquire knowledge and skills necessary to carry our Neuroscience and Applied Cognitive Science research in academic and/or applied settings. This will involve a course in Research Design and Statistics, a course in Discrete-variable Statistics 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.

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Program Requirements

The program involves three components:

1. Preparatory Course Work: Students will acquire knowledge and skills necessary to carry our Neuroscience and Applied Cognitive Science research in academic and/or applied settings. This will involve a course in Research Design and Statistics, a course in Discrete-variable Statistics 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.

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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.
PhD Program

The PhD program is offered in the fields: 1) applied social psychology; 2) clinical child and adolescent psychology; 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 Child and Adolescent Psychology; 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 and complete clinical practica to ensure adequate background preparation for PhD work.

Program 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 Child and Adolescent Psychology

PSYC*6580 [0.50] Foundations in 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] CCAP Clinical Practicum III
PSYC*7994 [1.00] Cognitive Behaviour Therapy Practicum
PSYC*7996 [0.50] Clinical Supervision, Consultation and Professional Development
PSYC*8000 [0.00] Clinical Internship

Students who complete this accredited Doctoral program in clinical psychology are expected to have breadth of training within the larger discipline of Psychology. 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;
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

PhD Program

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
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)
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*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

January 28, 2020
2019-2020 Graduate Calendar
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 [0.50]
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.

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.

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.

Applied Social Psychology

PSYC*6870 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 formulation, as well as the use of social policy as an instrument of social change.
Department(s): Department of Psychology

PSYC*6880 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
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Department(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSYC*6910</td>
<td>Critical Approaches to Applied Social Psychology</td>
<td>0.50</td>
<td>Department of Psychology</td>
</tr>
<tr>
<td>PSYC*6920</td>
<td>Applied Social Psychology and Intervention</td>
<td>0.50</td>
<td>Department of Psychology</td>
</tr>
<tr>
<td>PSYC*6930</td>
<td>Community, Culture &amp; Global Citizenship</td>
<td>0.50</td>
<td>Department of Psychology</td>
</tr>
<tr>
<td>PSYC*6600</td>
<td>Developmental Psychopathology: Etiology and Assessment</td>
<td>0.50</td>
<td>Department of Psychology</td>
</tr>
<tr>
<td>PSYC*6610</td>
<td>Integrated Child and Adolescent Assessment</td>
<td>0.50</td>
<td>Department of Psychology</td>
</tr>
<tr>
<td>PSYC*6020</td>
<td>Clinical and Diagnostic Interviewing Skills</td>
<td>0.50</td>
<td>Department of Psychology</td>
</tr>
<tr>
<td>PSYC*6270</td>
<td>Issues in Social Policy</td>
<td>0.50</td>
<td>Department of Psychology</td>
</tr>
<tr>
<td>PSYC*6580</td>
<td>Foundations in Child and Adolescent Psychotherapy</td>
<td>0.50</td>
<td>Department of Psychology</td>
</tr>
<tr>
<td>PSYC*6610</td>
<td>Advanced Child and Adolescent Psychotherapy</td>
<td>0.50</td>
<td>Department of Psychology</td>
</tr>
<tr>
<td>PSYC*6630</td>
<td>Developmental Psychology</td>
<td>0.50</td>
<td>Department of Psychology</td>
</tr>
<tr>
<td>PSYC*6690</td>
<td>Foundations in Cognitive Assessment of Child and Adolescents</td>
<td>0.50</td>
<td>Department of Psychology</td>
</tr>
<tr>
<td>PSYC*6700</td>
<td>Personality and Social Assessment of Children and Adolescents</td>
<td>0.50</td>
<td>Department of Psychology</td>
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<tr>
<td>PSYC*7991</td>
<td>CCAP Clinical Practicum I</td>
<td>0.25</td>
<td>Department of Psychology</td>
</tr>
<tr>
<td>PSYC*7992</td>
<td>CCAP Clinical Practicum II</td>
<td>0.50</td>
<td>Department of Psychology</td>
</tr>
<tr>
<td>PSYC*7993</td>
<td>CCAP Clinical Practicum III</td>
<td>1.00</td>
<td>Department of Psychology</td>
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<tr>
<td>PSYC*7994</td>
<td>Cognitive Behaviour Therapy Practicum</td>
<td>1.00</td>
<td>Department of Psychology</td>
</tr>
<tr>
<td>PSYC*7996</td>
<td>Clinical Supervision, Consultation and Professional Development</td>
<td>0.50</td>
<td>Department of Psychology</td>
</tr>
<tr>
<td>Course Code</td>
<td>Course Title</td>
<td>Credits</td>
<td>Description</td>
</tr>
<tr>
<td>-------------</td>
<td>------------------------------------------------------------------------------</td>
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<td>------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>PSYC*8000</td>
<td>Clinical Internship U [0.00]</td>
<td></td>
<td>A mark of satisfactory (SAT) in this course indicates that a student in the Clinical Child and Adolescent Psychology (CCAP) 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 CCAP.</td>
</tr>
<tr>
<td>PSYC*7100</td>
<td>Recruitment and Selection: Methods and Outcomes U [0.50]</td>
<td></td>
<td>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.</td>
</tr>
<tr>
<td>PSYC*7130</td>
<td>Work Attitudes and Behaviour U [0.50]</td>
<td></td>
<td>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.</td>
</tr>
<tr>
<td>PSYC*7040</td>
<td>Social Processes in the Workplace U [0.50]</td>
<td></td>
<td>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.</td>
</tr>
<tr>
<td>PSYC*7050</td>
<td>Research Seminar in Industrial/Organizational Psychology U [0.00]</td>
<td></td>
<td>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.</td>
</tr>
<tr>
<td>PSYC*7140</td>
<td>Consulting in Industrial/Organizational Psychology U [0.00]</td>
<td></td>
<td>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).</td>
</tr>
<tr>
<td>PSYC*7130</td>
<td>Introduction to Industrial/Organizational Psychology U [0.50]</td>
<td></td>
<td>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.</td>
</tr>
<tr>
<td>PSYC*7140</td>
<td>Industrial/Organizational Psychology Special Topic Doctoral Research Seminar U [0.50]</td>
<td></td>
<td>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.</td>
</tr>
</tbody>
</table>
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 (110 Former VMI, Ext. 53894) apapadop@uoguelph.ca

Graduate Program Assistant
Ariah Easley (2509 Stewart Building, Ext. 54005) mphinfo@uoguelph.ca

Graduate Faculty

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Professor, Population Medicine

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Claire Jardine
Associate Professor, Pathobiology

Andria Jones-Bitton
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Assistant Professor, Population Medicine

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Professor, Population Medicine

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Andrew Papadopoulos
Associate Professor, Population Medicine and Coordinator, Master of Public Health Program

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David Pearl
Associate Professor, Population Medicine

Zvonimir Poljak
Associate Professor, Population Medicine

Jan Sargeant
Professor, Population Medicine

Anita Tucker
Assistant Professor, Population Medicine

Scott Weese
Professor, Pathobiology

Jeffery Wichtel
- Professor and Dean, Ontario Veterinary College

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 their equivalent). Students with an honours degree without a biological or health focus will be required to complete the distance education BSc course PATH*5610 Principles of Disease by the conclusion of the first semester of their 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 will submit a one-page statement of interest including 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

Program 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 per academic semester). Students will complete at least six (0.50 credit) courses before they begin their practicum placement. The practicum will provide an opportunity to add function to the knowledge base achieved during the didactic portion of the program. A poster and public presentation developed from data gathered during the practicum will illustrate the cumulative experience during the Public Health Capstone course. This is a residency program as core courses and many 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.

Advising

The student’s program is established and progress kept under review by the Department of Population Health. The day-to-day responsibility will rest with the Graduate Program Coordinator, Master of Public Health program. There will be an Advisory Committee of at least two graduate faculty members, the chair of which will be the Graduate Program Coordinator, Master of Public Health program. The Advisory Committee must be established and the Advisory Committee Appointment form submitted to the Office of Graduate and Postdoctoral Studies not later than the 20th class day of the student’s second registered semester.

Graduate Diploma

This stand-alone diploma consists of four courses, including Applied Public Health Research, and at least two 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 program 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 their equivalent). Students with an honours degree without a biological or health focus will be required to complete the distance education BSc course PATH*5610 Principles of Disease by the conclusion of the first semester of their degree program. Candidates should have earned a B average in an honours BSc 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

Program 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. 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 program prior to initiating graduation procedures from the Graduate Diploma.

International Development Studies

The MPH program participates in the collaborative specialization in International Development Studies (IDS). Students in this option must register in the MPH program 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

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>PABI*6500</td>
<td>Infectious Diseases and Public Health</td>
<td>[0.50]</td>
</tr>
<tr>
<td>POPM*6200</td>
<td>Epidemiology I</td>
<td>[0.50]</td>
</tr>
</tbody>
</table>
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.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDRD*6100</td>
<td>[0.50]</td>
</tr>
<tr>
<td>EDRD*6690</td>
<td>[0.50]</td>
</tr>
<tr>
<td>PABI*6550</td>
<td>[0.50]</td>
</tr>
<tr>
<td>POPM*6210</td>
<td>[0.50]</td>
</tr>
<tr>
<td>POPM*6350</td>
<td>[0.50]</td>
</tr>
<tr>
<td>POPM*6950</td>
<td>[0.50]</td>
</tr>
<tr>
<td>POPM*6590</td>
<td>[1.00]</td>
</tr>
<tr>
<td>POPM*6600</td>
<td>[0.50]</td>
</tr>
</tbody>
</table>

Disaster Planning and Management
Program Evaluation
Epidemiology of Zoonoses
Epidemiology II
Safety of Foods of Animal Origins
Studies in Population Medicine
Public Health Practicum II
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)
efinnis@uoguelph.ca

Public Issues Anthropology Graduate Program Coordinator
Thomas McIlwraith (616 MacKinnon, Ext. 53545)
tad.mcilwraith@uoguelph.ca

Graduate Program Assistant
Shelagh Daly (624 MacKinnon, Ext. 53895)
daly@uoguelph.ca

Graduate Faculty

Elizabeth Finnis
BA McMaster, MA Western, PhD McMaster - Associate Professor

Karine Gagne
BA Concordia, MA, PhD University of Montreal - Assistant 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 - Associate 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.

Program 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 and the pro-seminar (ANTH*6700) in their first two semesters. 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

Public Issues 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.

One Health

The Department of Philosophy participates in the collaborative specialization in One Health. Master’s and Doctoral students wishing to undertake thesis research or their major research paper/project with an emphasis on one health are eligible to apply to register concurrently in Philosophy and the collaborative specialization. Students should consult the One Health listing for more information.

Courses

Core courses

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

ANTH*6080 Anthropolocical 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*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*6700 Pro-seminar F-W [0.00]
The pro-seminar concerns matters involved in graduate studies and later work as a professional anthropologist, including how to form a graduate advisory committee, assistantship responsibilities, presentation skills, exploration of careers in anthropology, writing grant proposals, reports and articles, and teaching.

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, 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

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
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.

**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.

**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.

**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.

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. Students are strongly encouraged to arrange their own internship during the summer semester, though this is not a requirement. 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 four faculty within the program along with one 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. 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.

**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.

**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
In addition the student is required to complete an additional seven (7) 0.5 credit elective courses in consultation with their advisory committee.

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.

Students may develop an area of specialization with their advisory committees through course work, selection of elective courses, student research. 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 four faculty within the program along with one 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 3-5 semester 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.

Program Requirements

- Two (2.0) credits earned from the MSc (Planning) course list from SEDRD, related to their research interest, chosen with the advice of their Advisory Committee.
- Senior Planning and Development (listed as RPD*6290) is required.
- 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.

One Health

Rural Planning and Development participates in the collaborative specialization in One Health. Master’s and Doctoral students wishing to undertake thesis research or their major research paper/project with an emphasis on one health are eligible to apply to register concurrently in Rural Planning and Development and the collaborative specialization. Students should consult the One Health listing for more information.
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
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:

1. 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.

2. 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

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Glen C. Filson
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John FitzSimons
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Cecelia Paine
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Laxmi Pant
BSc Tribhuvan, MSc Norwegian University of Life Sciences, PhD Guelph - Adjunct Professor, SEDRD

Jim Taylor
BSc (LA) Iowa, MLA Berkeley - Professor Emeritus, SEDRD

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 SEDRD.

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 greatly enhances 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 Graduate Program Coordinator 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.

Program 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 and upon completion of 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, Graduate 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

<table>
<thead>
<tr>
<th>Course ID</th>
<th>Title</th>
<th>Credits</th>
<th>Description</th>
<th>Department(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>RST*6000</td>
<td>Sustainable Rural Systems F-W [1.00]</td>
<td></td>
<td>Sustainable development theory in the rural communities and environment context.</td>
<td>School of Environmental Design and Rural Development</td>
</tr>
<tr>
<td>RST*6100</td>
<td>Integrative Research Methods F-W [1.00]</td>
<td></td>
<td>Research design and evaluation with a focus on measures of sustainability and on interdisciplinary applications.</td>
<td>School of Environmental Design and Rural Development</td>
</tr>
<tr>
<td>RST*6300</td>
<td>Research Seminar U [0.25]</td>
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<td></td>
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#### Sector Core Courses

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<th>Title</th>
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<th>Description</th>
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<tr>
<td>RST*6500</td>
<td>Special Topics U [0.50]</td>
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<td></td>
<td>School of Environmental Design and Rural Development</td>
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</tbody>
</table>
Social Practice and Transformational Change

The PhD in Social Practice and Transformational Change operates at the intersection of rigorous, transformative scholarship that cuts across conventional disciplinary boundaries. Notable areas of strength among the core faculty include community engaged scholarship, disability studies, feminist and gender studies, Indigenous studies, global studies, and teaching and learning.

Advisory Staff

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Leah Levac
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Mavis Morton
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Kate Parizeau
Assistant Professor, Geography

Carla Rice
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Sharada Srinivasan
Associate Professor, Canada Research Chair in Gender, Justice and Development, Sociology

Deborah Stienstra
Professor and Jarislowsky Chair in Families and Work, Political Science

Rénée Sylvain
Associate Professor, Sociology

PhD Program

The objective of the PhD in Social Practice and Transformational is to build competency in research, practice (as a specific kind of professional activity) and engagement across these areas:

a. the critical theorization of social practice and its relationship to policy, programs and service delivery and to transformational change;
b. the design and implementation of practice-based research projects and research-based practices; and
c. the development of principled, ethical and sustainable frameworks for collaborative, community-engaged initiatives.

Admission Requirements

Applicants to the PhD program should have a recognized course or thesis-based master’s degree with a minimum average of at least 78% average in their postgraduate studies. Applicants who have not completed a masters’ degree but have considerable relevant professional experience outside the academy may be considered for direct entry into the doctoral program. Applicants must submit a statement of their research interests including evidence of experience in their chosen research field. It is essential that applicants contact potential advisors in the department prior to submission of an application. Students are admitted in September. The program office should be consulted for admission deadlines.

Program Requirements

The PhD in Social Practice is comprised of 1.5 credits of coursework, a qualifying examination (QE), and thesis. Individual students may elect to take courses offered as part of other University of Guelph programs that are relevant to their research interests and development, as determined by students and their advisory committees.

The QE involves four components:

a. a letter of promise, addressed to the Program Director, signed by all members of the advisory committee, evaluating the student’s research performance to date and the student’s potential as a researcher;
b. a QE proposal approved by the student’s advisory committee which includes area(s) of specialization, proposed form of presentation, and proposed oral examination format;
c. the presentation of literature related to, but broader than, the student’s specific area of research to be pursued in the dissertation, including preliminary thesis statement; and
d. an oral examination of c) the presentation including the following components to be determined in b) the proposal: student reflections on the presentation (oral or other formal); committee questions about the presentation (shared ahead of exam or during the exam); and discussion of preliminary dissertation research focus.

The QE is evaluated as pass or fail. The student passes the QE if no more than one member of the QE committee votes unsatisfactory. An abstention is considered an unsatisfactory vote. If the QE has been deemed by examiners as a fail, the QE committee will provide clear feedback to the student through the advisor on the quality issues that need to be addressed in a second examination no later than six months from the failed attempt. Failure of the QE oral the second time constitutes a recommendation to the Board of Graduate Studies that the student be required to withdraw.

Courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Department(s)</th>
</tr>
</thead>
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<td>SOPR*6000</td>
<td>Social Practice and Transformational Change</td>
<td>Dean's Office, College of Social and Applied Human Sciences</td>
</tr>
<tr>
<td>SOPR*6100</td>
<td>Research and Social Practice</td>
<td>Dean's Office, College of Social and Applied Human Sciences</td>
</tr>
<tr>
<td>SOPR*6200</td>
<td>Methodologies Lab</td>
<td>Dean's Office, College of Social and Applied Human Sciences</td>
</tr>
</tbody>
</table>
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:

- **Environment, Food, and Communities (MA, PhD)** This field reflects sociological interests in understanding societal-ecological interactions more broadly. The specific focus may include environmental/natural resources/food systems and/or environmental justice/community sustainability. Students specializing in this field will be encouraged to draw on established methodologies in the field, including the comparative and historical approach. Attention will be given to the ways in which structure/power/culture and class/gender/race and ethnicity play out in at least one of the substantive topics comprising this field.

- **Work and Organization (MA, PhD)** This field reflects sociological interests in changing patterns of work and employment in comparative contexts, labor markets, gender and work, industrial and organizational change, economic restructuring and work, 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 and re-organization of work.

- **Crime and Social Control (MA, PhD)** This field reflects sociological interests into how crime is defined, measured, explained and reacted to by society. Within this field students will be exposed to scholarly material on a broad range of topics including: cyberbullying, victimization, homelessness, intimate partner violence, drug policy, school violence, feminist criminology, critical criminology, restorative justice, sociology of risk, policing, the social construction of crime, inmate re-integration, youth justice, wrongful convictions, and life course criminology.

- **Identities and Social Inclusion (MA, PhD)** This field reflects 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 Indigenous issues and policies related to multiculturalism, equity and local or regional autonomy.

See the Department website at [http://www.sociology.uoguelph.ca/](http://www.sociology.uoguelph.ca/) for additional information.

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**Carolyn Yule**
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**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) environment, food and communities; 2) work and organization; 3) crime and social control; and 4) identities and social inclusion.

**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](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.

**Program 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.

**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, Pre-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.

**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, Pre-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 four fields within the discipline of Sociology that build on current faculty strengths. These fields are: 1) environment, food and communities; 2) work and organization; 3) crime and social control; and 4) identities and social inclusion.

Program Requirements

All students in the PhD program are required to successfully complete at least four courses during the first two semesters of study, including the PhD professional seminar SOC*6750, Advanced Topics in Sociological Theory SOC*6800, and Advanced Issues in Mixed Research Methodologies SOC*6200. Students must also successfully complete a qualifying exam 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/graduate-studies/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/cide/ 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*6200 Advanced Issues in Mixed Research Methodologies W [0.50]
This course will examine the foundations and a range of approaches used in mixed methods sociological research. Students will acquire a deeper understanding of how using a mixed methods research approach in sociological research can enhance scholarly rigour in a theoretically informed research project.
Restriction(s): Students in the PhD program in Sociology only
Department(s): Department of Sociology and Anthropology

SOC*6700 Pre-seminar F-W [0.00]
The pre-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*6750 PhD Professional Seminar F-W [0.50]
This professional seminar provides PhD students in Sociology opportunities to develop professional skills; develop and foster an intellectual culture; facilitate cohort building, mentoring and provide peer support; and contribute to the intergenerational transmission of knowledge.
Restriction(s): Students in the PhD 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

Environment, Food and Communities

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 and Organization

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 also 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

Crime and Social Control

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

Identities and Social Inclusion

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
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 Assistant**  
Barb Merrill  
(201 Zavitz Hall, Ext. 54671)  
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**Graduate Program Coordinator**  
Sandra Rechico  
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### Graduate Faculty

**Diane Borsoi**  
BFA York, MFA Concordia - Associate Professor

**James Cari**  
BFA Victoria, BA McGill, MFA Rutgers - Professor

**Susan Dobson**  
BAA Ryerson University, MFA University of Guelph - Associate Professor

**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 (FASTWURMS)**  
AOCA Ontario College of Art - Associate Professor

**Nestor Kruger**  
AOCA Ontario College of Art - Associate Professor

**Martin Pearce**  
BFA, MFA Royal College of Art England - Associate Professor

**Sandra Rechico**  
BEd Alberta - Associate Professor

**Dai Skuse (FASTWURMS)**  
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 Boetzes**  
BA Victoria, MA, PhD McGill - 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 Smyliotopoulos**  
BA Victoria, MA University of York, PhD McGill - Associate Professor

### MFA Program

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.

### Program 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.

### Core Courses

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.

### Advisory Committee

There will be an Advisory Committee of at least three graduate faculty members.

### 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. An external examiner from outside the university will be selected to sit on the examination committee and will submit a written appraisal of the oral defence, paper and exhibition. 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

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Prerequisite(s)</th>
<th>Department(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FINA*6510</td>
<td>Introduction to Graduate Studio F [1.50]</td>
<td></td>
<td></td>
<td>School of Fine Art and Music</td>
</tr>
<tr>
<td>FINA*6515 MFA Studio I W [1.50]</td>
<td>Sustained work at an independent level under the supervision of the chair of the student's advisory committee.</td>
<td></td>
<td>FINA*6510</td>
<td>School of Fine Art and Music</td>
</tr>
<tr>
<td>FINA*6530 MFA Teaching Practicum I F [0.50]</td>
<td>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.</td>
<td></td>
<td>School of Fine Art and Music</td>
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</tr>
<tr>
<td>FINA*6531 MFA Teaching Practicum II F [0.50]</td>
<td>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. Prerequisite(s): FINA*6530</td>
<td></td>
<td>School of Fine Art and Music</td>
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<tr>
<td>FINA*6540 MFA Seminar I F [0.50]</td>
<td>Examination of critical issues in the visual arts relevant to studio practice</td>
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<tr>
<td>FINA*6545 MFA Seminar II W [0.50]</td>
<td>Continuation of issues examined in FINA*6540</td>
<td></td>
<td>FINA*6540</td>
<td>School of Fine Art and Music</td>
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<tr>
<td>FINA*6551 Seminar in Art Theory and Criticism I W [0.50]</td>
<td>Selected topics in art theory and criticism with particular relevance to studio practice. Prerequisite(s): Admission to MFA program or permission of instructor.</td>
<td></td>
<td>School of Fine Art and Music</td>
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<tr>
<td>FINA*6610 MFA Studio II F [1.50]</td>
<td>Continuation of FINA*6515</td>
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<td>FINA*6515</td>
<td>School of Fine Art and Music</td>
</tr>
<tr>
<td>FINA*6615 MFA Studio III W [1.50]</td>
<td>Continuation of FINA*6610</td>
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<td>School of Fine Art and Music</td>
</tr>
<tr>
<td>FINA*6640 MFA Seminar III F [0.50]</td>
<td>Continuation of FINA*6545</td>
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<td>FINA*6545</td>
<td>School of Fine Art and Music</td>
</tr>
<tr>
<td>FINA*6641 MFA Seminar IV W [0.50]</td>
<td>Continuation of FINA*6640</td>
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<td></td>
<td>School of Fine Art and Music</td>
</tr>
<tr>
<td>FINA*6652 Individual Study in Art Theory and Criticism W [0.50]</td>
<td>Students will pursue special study under the guidance of a faculty member with appropriate expertise. Prerequisite(s): Approval of the co-ordinator of the MFA program.</td>
<td></td>
<td>School of Fine Art and Music</td>
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Additional and Elective Courses

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</thead>
<tbody>
<tr>
<td>FINA*6550 Selected Topics in Fine Art U [0.50]</td>
<td>Seminar in a fine art topic in a subject to be specified by the instructor.</td>
<td></td>
<td></td>
<td>School of Fine Art and Music</td>
</tr>
<tr>
<td>FINA*6651 Individual Study in Contemporary Art U [0.50]</td>
<td>Students will pursue special study under the guidance of a faculty member with appropriate expertise.</td>
<td></td>
<td>Approval of the co-ordinator of the MFA program.</td>
<td>School of Fine Art and Music</td>
</tr>
</tbody>
</table>
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.

Elective courses are subject to the special interests of faculty research and practice; these courses will rotate regularly among core faculty. Subject to the approval of the student's program, 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.

Program Requirements

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

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).

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.

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.
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

Acting Director
HS Chris Choi (304 MACS, Ext. 53370)
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Graduate Program Coordinator
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Graduate Program Assistant
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Graduate Program Assistant
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Graduate Faculty

HS Chris Choi
BA Chung-Ang, MTA Georgia Washington, PhD Texas A&M - Professor and Acting Director, School of Hospitality, Food and Tourism Management

Statia Elliot
BCom St. Mary’s, MA McMaster, PhD Carleton - Professor and Interim Associate Dean, External Relations, Gordon S. Lang School of Business and Economics

Joan Flaherty
BA Guelph, MA(English Literature), MSc (Adult and Extension Education) Guelph - Associate Professor

Lianne Foti
BCom Guelph, MBA EDHEC, DBA Bradford - Assistant Professor

Mark Holmes
BCom, MSA Ryerson, PhD York - Assistant Professor

WooMi Jo
BS Kansas, MS Houston, PhD Kansas - Associate Professor

Marion Joppé
BA Waterloo, MLaw, PhD d’Aix-Marseille III - Professor

Nadège Levallé
MMGT Grenoble, MBA Ottawa, PhD Queen’s - Assistant Professor

Bruce McAdams
BCom, MA Guelph - Associate Professor

William Murray
BA Algonquin, MBA Guelph, PhD Saint Mary’s - Assistant Professor

Norm O’Reilly
BSc Waterloo, MBA Ottawa, PhD Carleton - Professor and Director, International Institute for Sport Business and Leadership, School of Hospitality and Tourism Management

Simon Somogyi
BWM, PhD Adelaide - Associate Professor

Erna van Duren
BA Waterloo, MSc, PhD, Guelph - 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).

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.

Program 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

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>TRMH*6100</td>
<td>Foundations of Tourism and Hospitality</td>
<td>0.50</td>
</tr>
<tr>
<td>TRMH*6200</td>
<td>Contemporary Issues in Tourism</td>
<td>0.50</td>
</tr>
<tr>
<td>TRMH*6310</td>
<td>Research Applications in Tourism and Hospitality</td>
<td>0.50</td>
</tr>
<tr>
<td>TRMH*6400</td>
<td>Thesis Proposal</td>
<td>1.00</td>
</tr>
</tbody>
</table>

Restricted Electives

One of the following quantitative research methods courses:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>TRMH*6080</td>
<td>Qualitative Research Methods</td>
<td>0.50</td>
</tr>
<tr>
<td>MCSR*6080</td>
<td>Qualitative Research Methods</td>
<td>0.50</td>
</tr>
<tr>
<td>ANTH*6140</td>
<td>Qualitative Research Methods</td>
<td>0.50</td>
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<tr>
<td>SOC*6140</td>
<td>Qualitative Research Methods</td>
<td>0.50</td>
</tr>
<tr>
<td>FRAN*6020</td>
<td>Qualitative Research Methods</td>
<td>0.50</td>
</tr>
</tbody>
</table>

One of the following topic courses:

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>TRMH*6110</td>
<td>Foundations of Food Industry Management</td>
<td>0.50</td>
</tr>
<tr>
<td>TRMH*6120</td>
<td>Foundations of Sport Management</td>
<td>0.50</td>
</tr>
<tr>
<td>TRMH*6250</td>
<td>Tourism and Sustainable Development</td>
<td>0.50</td>
</tr>
<tr>
<td>TRMH*6270</td>
<td>Data Mining Practicum</td>
<td>0.50</td>
</tr>
<tr>
<td>TRMH*6630</td>
<td>Special Topics in Tourism</td>
<td>0.50</td>
</tr>
</tbody>
</table>

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 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, food management, sports management 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.
Program 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
GEOG*6180 [0.50] Geographical Research Methods II

One of the following qualitative research methods courses:
TRMH*6080 [0.50] Qualitative Research Methods
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 Research Methods

One of the following topic courses:
TRMH*6110 [0.50] Foundations of Food Industry Management
TRMH*6120 [0.50] Foundations of Sport Management
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

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<td>TRMH*6080</td>
<td>Qualitative Research Methods</td>
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<td>MCS*6080</td>
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<td>ANTH*6140</td>
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<td>SOC*6140</td>
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<td>TRMH*6110</td>
<td>Foundations of Food Industry Management</td>
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<td>TRMH*6120</td>
<td>Foundations of Sport Management</td>
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<td>TRMH*6250</td>
<td>Tourism and Sustainable Development</td>
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<td>TRMH*6270</td>
<td>Data Mining Practicum</td>
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TRMH*6290 Research Methods for Tourism and Hospitality [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 [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
Shayan Sharif (PAHL 4824, Ext. 54641)
shayan@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.

Program 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 fulfill 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.