The information published in this Graduate Calendar outlines the rules, regulations, curricula, programs and fees for the 2012-2013 academic years, including the Fall Semester 2012, the Winter Semester 2013 and the Summer Semester 2013.

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

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

The University is a full member of:

- The Association of Universities and Colleges of Canada

Contact Information:

University of Guelph
Guelph, Ontario, Canada
N1G 2W1
519-824-4120

Revision Information:

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

Limitations
The University of Guelph reserves the right to change without notice any information contained in this calendar, including any rule or regulation pertaining to the standards for admission to, the requirements for the continuation of study in, and the requirements for the granting of degrees or diplomas in any or all of its programs.
The university will not be liable for any interruption in, or cancellation of, any academic activities as set forth in this calendar and related information where such interruption is caused by fire, strike, lock-out, inability to procure materials or trades, restrictive laws or governmental regulations, actions taken by the faculty, staff or students of the university or by others, civil unrest or disobedience, Public Health Emergencies, or any other cause of any kind beyond the reasonable control of the university.
The University of Guelph reaffirms section 1 of the Ontario Human Rights Code, 1981, which prohibits discrimination on the grounds of race, ancestry, place of origin, colour, ethnic origin, citizenship, creed, sex, sexual orientation, handicap, age, marital status or family status.
The university encourages applications from women, aboriginal peoples, visible minorities, persons with disabilities, and members of other under-represented groups.
Introduction

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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/DLB/Laws/Statutes/English/90f31_e.htm. This information is used by University officials in order to carry out their authorized academic and administrative responsibilities and also to establish a relationship for alumni and development purposes. Certain personal information is disclosed to external agencies, including the Ontario Universities Application Centre, the Ministry of Training, Colleges and Universities, and Statistics Canada, for statistical and planning purposes, and is disclosed to other individuals or organizations in accordance with the Office of Registrarial Services Departmental Policy on the Release of Student Information. For details on the use and disclosure of this information call the Office of Registrarial Services at the University at (519) 824-4120 or see http://www.uoguelph.ca/registrar/registrar/index.cfm?index.

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 the Office of Graduate Studies.

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

Student Confidentiality and Release of Student Information Policy Excerpt

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

Complete policy at http://www.uoguelph.ca/policies.
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IX. Graduate Programs

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

### Degree Programs listed by College

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<td>Creative Writing</td>
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<td>English</td>
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<td>European Studies</td>
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<td>French</td>
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<tr>
<td>History - Tri-University Program</td>
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<td>Latin American and Caribbean Studies</td>
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<td>Philosophy</td>
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<td>Literary Studies/Theatre Studies in English</td>
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<th>College of Biological Science</th>
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<td>Human Health and Nutritional Sciences</td>
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<td>Integrative Biology</td>
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<td>Molecular and Cellular Biology</td>
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<th>College of Management and Economics</th>
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<td>Business Administration</td>
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<td>• Food and Agribusiness Management</td>
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<td>• Hospitality and Tourism</td>
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<td>Economics</td>
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<td>Leadership</td>
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<td>Management</td>
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<td>Marketing and Consumer Studies</td>
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<th>College of Physical and Engineering Science</th>
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<td>Chemistry</td>
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<td>Computer Science</td>
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<td>Engineering</td>
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<td>Mathematics and Statistics</td>
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<td>Physics</td>
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<th>College of Social and Applied Human Sciences</th>
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<td>Criminology and Criminal Justice Policy</td>
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<td>Family Relations and Applied Nutrition</td>
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<td>Geography</td>
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<td>Political Science</td>
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<td>Public Issues Anthropology</td>
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<td>Sociology</td>
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<th>Ontario Agricultural College</th>
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<td>Animal and Poultry Science</td>
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<td>Capacity Development and Extension</td>
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<td>Environmental Sciences</td>
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<td>Food, Agricultural and Resource Economics</td>
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<td>Food Science</td>
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<td>Landscape Architecture</td>
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<td>Plant Agriculture</td>
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<td>Rural Planning and Development</td>
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<td>Biomedical Sciences</td>
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<td>Clinical Studies</td>
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<td>Pathobiology</td>
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<td>Population Medicine</td>
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<td>Public Health</td>
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<td>Veterinary Science</td>
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<th>Interdepartmental Programs</th>
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<td>Interdepartmental programs involve faculty members across departments.</td>
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<tr>
<td>Bioinformatics</td>
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<td>Biophysics</td>
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### Collaborative Programs

Collaborative programs are intended to provide an additional multidisciplinary experience for students. Students complete the requirements of their home program plus those of the collaborative program.

- International Development Studies
- Neuroscience
- Toxicology

### Degree Programs listed by Division

#### Humanities

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

#### Physical and Engineering Sciences

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

#### Plant Sciences

- Environmental Sciences
- Integrative Biology
- Molecular and Cellular Biology
- Plant Agriculture

#### Social Sciences

- Business Administration
- Capacity Development and Extension
- Criminology and Criminal Justice Policy
- Economics
- Family Relations and Applied Nutrition
- Geography
- International Development Studies

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May 13, 2014
Landscape Architecture
Marketing and Consumer Studies
Political Science
Psychology
Public Issues Anthropology
Sociology
Rural Planning and Development
Animal and Poultry Science

The Department of Animal and Poultry Science offers programs of study leading to MSc and PhD degrees. Animals of significance in food production are the department’s major interest and research emphasis. The graduate program encompasses four 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**
André Robinson (146 ANNU, Ext. 53679)
andyr@uoguelph.ca

**Graduate Coordinator**
John Cant (236 ANNU, Ext. 56222)
jcant@uoguelph.ca

**Graduate Secretary**
Wendy McGrattan (144 ANNU, Ext. 56215)
wmcgrattan@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.*

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

**Dominique P. Bureau**
BSc (Agr), MSc Laval, PhD Guelph - Professor

**John P. Cant**
BSc (Agr) Nova Scotia, MS, PhD California - Professor and Graduate Coordinator

**Cornelius E.M. de Lange**
BSc, MSc Wageningen, PhD Alberta - Professor

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

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

**Niel A. Karrow**
BSc Guelph, MSc, PhD Waterloo - Professor

**Julong 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

**Brian W. McBride**
BSc, MSc Guelph, PhD Alberta - Professor

**Stephen P. Miller**
BSc (Agr), PhD Guelph - Associate Professor

**Richard D. Moccia**
BSc, MSc Guelph - Professor

**Vern R. Osborne**
BSc, MSc, PhD Guelph - Associate Professor

**J. Andrew B. Robinson**
BSc (Agr), MSc Guelph, PhD Cornell - Associate Professor and Chair

**Flavio S. Schenkel**
BBA, BSc, and MSc Brazil, PhD Guelph - Associate Professor

**Trevor K. Smith**
BSc British Columbia, MSc Manitoba, PhD Cornell - Professor

**E. James Squires**
BSc, MSc, PhD Memorial - Professor

**Tina M. Widowski**
BS, MS, PhD Illinois - Professor

**Faculty at Kemptville Campus**

**Katrina Merkies**
BSc, PhD Guelph - Associate Professor

**Trevor DeVries**
BSc, PhD British Columbia - Associate Professor

**Faculty at Campus D’Alfred**

**Renee Bergeron**
BSc, MSc Laval, PhD Illinois - Associate Professor

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**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 course work and major paper. The MSc by course work and major paper is offered in three areas of specialization: 1) animal breeding and genetics, 2) animal nutrition and metabolism and 3) animal behaviour and welfare.

**Admission Requirements**

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

**Degree Requirements**

**MSc by 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 (0.0 credit).

**MSc by Course Work and Major Paper**

Candidates for the MSc degree by course work and major paper option must complete a minimum of 4.0 credits (9 courses). Of these courses, one will be the department Seminar course, ANSC*6600 (0.0 credit), and another will be Major Paper in Animal and Poultry Science, ANSC*6900 (1.0 credit). The major paper will be a detailed, critical review of an area of study related to the specialization chosen by the student and should include analyses and interpretations of relevant data. The content of the major paper will be presented to the department in the Seminar course.

At the beginning of the program, the student and student’s advisory committee will design the course-work 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 and Poultry Science. 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*6240 [0.50] Topics in Animal Genetics and Genomics
- 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*6620 [0.50] Poultry and Swine Nutrition
- ANSC*6630 [0.50] Modelling Metabolic Processes
- ANSC*6650 [0.50] Biometry for Animal Sciences
- ANSC*6360 [0.50] Techniques in Animal Nutrition Research
- ANSC*6450 [0.50] Topics in Animal Biotechnology
- ANSC*6460 [0.50] Lactation Biology
- ANSC*6470 [0.50] Advanced Animal Nutrition and Metabolism I
- ANSC*6480 [0.50] Advanced Animal Nutrition and Metabolism II

**Animal Behaviour and Welfare**

- ANSC*6900 [1.00] Major Paper in Animal and Poultry Science
- ANSC*6440 [0.50] Advanced Critical Analysis in Applied Ethology
- ANSC*6700 [0.50] Animals in Society: Historical and Global Perspectives on Animal Welfare
- ANSC*6710 [0.50] Assessing Animal Welfare in Practice
- ANSC*6720 [0.50] Scientific Assessment of Affective States in Animals
- ANSC*6730 [0.50] Applied Environmental Physiology: Applications to Animal Care Standards
- ANSC*6740 [0.50] Special Topics in Applied Animal Welfare Science
- UNIV*6030 [0.50] Seminars and Analysis in Animal Behaviour and Welfare

The MSc by course work and major paper degree will require a minimum of three semesters of full-time study (or the equivalent).

**PhD Program**

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

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

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

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

Degree Requirements

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

The number of courses required for a PhD program will be decided by the student’s advisory committee in consultation with the student. The minimum requirement is the Seminar course, ANSC*6600.

Collaborative Programs

Neuroscience MA/MSc/PhD

The Department of Animal and Poultry Science partipates in the MA/MSc/PhD program in neuroscience. Please consult the Neuroscience listing for a detailed description of the MA/MSc/PhD collaborative program.

Toxicology MSc/PhD

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

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

ANSC*6210 Principles of Selection in Animal Breeding W [0.50]

Definition of selection goals, prediction of genetic progress and breeding values, and the comparison of selection programs.

ANSC*6240 Topics in Animal Genetics and Genomics F [0.50]

Current literature and classical papers pertaining to quantitative genetics, animal breeding and animal genomics are reviewed in detail through presentation, discussion and critical analysis.

ANSC*6370 Quantitative Genetics and Animal Models F [0.50]

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.

ANSC*6390 QTL and Markers W [0.50]

Advanced training in QTL mapping and selection assisted by genetic markers.

ANSC*6450 Topics in Animal Biotechnology W [0.50]

The impact of recombinant DNA techniques on present and future research in animal science and on the livestock industry is critically appraised.

Animal Nutrition

ANSC*6010 Topics in Comparative Animal Nutrition F [0.50]

Current topics in the feeding and nutrition of agricultural, companion and captive animal species. Emphasis is placed on the influence of nutrients on metabolic integration at tissue, organ and whole-animal levels. A nutritional case study will be conducted to allow students to solve practical feeding problems by applying basic nutritional principles. The course is offered every other year on even years.

ANSC*6020 Poultry and Swine Nutrition W [0.50]

A discussion of current topics in the feeding and nutrition of domestic fowl and swine based on the critical appraisal of selected journal readings.

ANSC*6030 Modelling Metabolic Processes F [0.50]

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.

ANSC*6360 Techniques in Animal Nutrition Research W [0.50]

Theory and/or practices of techniques to evaluate feedstuffs and determine nutrient utilization in poultry, swine and ruminants is covered through lectures, short laboratories and a major project.

ANSC*6470 Advanced Animal Nutrition and Metabolism I F [0.50]

A systematic review of key aspects of energy, protein, amino acid and carbohydrate utilization and metabolism in farm animals.

ANSC*6480 Advanced Animal Nutrition and Metabolism II W [0.50]

A systematic review of key aspects of lipid, vitamin and mineral utilization and metabolism in farm animals.

Animal Physiology

ANSC*6400 Mammalian Reproduction W [0.50]

Discussions and applications of methodology for collection and examination of gametes and embryos and for measurements of hormones in biological fluids. (Odd years only.)

ANSC*6440 Advanced Critical Analysis in Applied Ethology F [0.50]

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.

ANSC*6460 Lactation Biology F [0.50]

An in-depth systems analysis of lactation, comparing the cow, pig, rat, human and seal. Mammary development from conception through to lactogenesis, lactation and involution will be covered. Hypotheses of regulation of the biochemical pathways of milk synthesis will be tested in relation to experimental observations.

ANSC*6250 Growth and Metabolism W [0.50]

Animal growth and metabolism are considered at the cellular level in a manner that extends beyond the basic disciplines of biometrics and biochemistry with attention focused on the main carcass components — muscle, fat and bone.

Animal Behaviour and Welfare

ANSC*6700 Animals in Society: Historical and Global Perspectives on Animal Welfare F [0.50]

A seminar course covering society's duties to animals. Students will learn about the major ethical theories that deal with society's duties towards animals, the main scientific approaches to animal welfare, and the relationship of science to ethics. A brief history of human-animal relationships will be covered and cultural differences described. Students will use this to analyze some current issues.

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

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

Prerequisite(s): ANSC*6700

External Course Code(s): Winter offering on-campus, Summer offering Distance Education.

ANSC*6730 Applied Environmental Physiology: Applications to Animal Care Standards W [0.50]

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

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

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

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

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

**ANSC*6050 Biometry for Animal Sciences F [0.50]**
For students involved in animal research. The course will provide outlines of appropriate presentation and analysis of experimental data with emphasis on different analytical techniques.

**ANSC*6100 Special Project F,W,S [0.50]**
Supervised program of study in some aspect of animal and poultry science that can involve an experimental project and/or detailed analysis of the literature.

**ANSC*6600 Seminar F,W [0.00]**
This course is required for successful completion of MSc and PhD programs. The major findings of the thesis or major paper are presented to the department.

**ANSC*6900 Major Paper in Animal and Poultry Science F,W,S [1.00]**
A detailed, critical review of an area of study related to the specialization of students in the MSc by course work and major paper option that includes analysis and interpretation of relevant data.
Art History and Visual Culture

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 MA in Art History and Visual Culture is the first MA in this country which will provide a much-needed critical perspective fundamentally engaged with the history, politics, ideology, theory, and discourse not only of art, but, more significantly, the critical practices which inform how art's history is taught, marketed, and disseminated. What makes the program unique, dynamic, and exciting is its self-reflexivity, that is, its investigation of the discipline itself. By critically exploring a wider purview of objects, the program will be structured so as to provide maximum flexibility, introducing students to interdisciplinary inquiry and holistically engaging with objects in their multidimensionality. In other words, students will learn to discuss and critically write about objects in their material, critical, theoretical, and contextual totalities. Students will also explore the concept of identity, the power of visual rhetoric, and the shifting power dynamics inherent in its art and its disciplines both in historical and contemporary contexts.

Administrative Staff

John Kissick
Director of SOFAM (Zavitz Hall 203, Ext. 56930)
jkissick@uoguelph.ca

Dominic Marner
Graduate Coordinator (Johnston Hall 121, Ext. 54382)
dmarner@uoguelph.ca

Barb Merill
Graduate Secretary (Zavitz Hall 201, Ext. 54671)
bmerill@uoguelph.ca

Graduate Faculty

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

MA Program

The MA in Art History and Visual Culture examines the production and consumption of images, objects, and spaces from varied cultures. It challenges many 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. Intercultural visual analysis necessarily questions conceptions of "high" and "low" culture and requires that we substantially change the ways in which we practice the discipline of Art History.

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

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

Admission Requirements

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

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

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

Degree Requirements

The program is a five-semester MA in Art History and Visual Culture for students with a four-year undergraduate honours degree in the arts or social sciences. The MA program has a 2.0 credit course requirement, as well as a thesis for the completion of the program. The thesis consists of an extensive piece of research and an oral examination (defence).

Each degree candidate is required to complete the course work, colloquium oral presentation, and a thesis, which consists of an extended piece of research, and an oral examination. The three components represent a significant body of research and production, and demonstrate a thoroughly engaged investigation into the historical and conceptual considerations of the thesis topic. The thesis topic is subject to the approval of the MA Examination Committee, which includes an examiner from the profession. The thesis is a project of publishable quality. In essay form, it discusses the critical, historical, and theoretical aspects of the student's subject of research. Students are expected to present and defend their work orally in a manner appropriate to a professional art historian's public presentation.

A total of 2.0 credits are required for the completion of this program. In addition to individually oriented Critical Methods I and II courses, students are required to complete two MA seminars. A maximum of one course outside Art History may be substituted for courses in Art History and Visual Culture graduate offerings. The courses selected must be acceptable to the school and the Board of Graduate Studies for graduate credit. There are 4 ‘substantive’ courses that comprise the candidate's prescribed studies, and in which the student must obtain an overall average grade of at least 'B-' standing.

Courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>AVC*6100</td>
<td>Proseminar: Critical Methods I</td>
<td>0.50</td>
</tr>
<tr>
<td>AVC*6200</td>
<td>Proseminar: Critical Methods II</td>
<td>0.50</td>
</tr>
<tr>
<td>AVC*6300</td>
<td>Special Topics in Art History and Visual Culture</td>
<td>0.50</td>
</tr>
<tr>
<td>AVC*6400</td>
<td>Practicum: Art Institutions</td>
<td>0.50</td>
</tr>
<tr>
<td>AVC*6500</td>
<td>Directed Reading</td>
<td>0.50</td>
</tr>
</tbody>
</table>

Prerequisite(s): AVC*6100

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.

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.
Bioinformatics

The organization and administration of the graduate program in bioinformatics are the responsibility of the Bioinformatics Graduate Faculty. Bioinformatics is the development and application of computational, mathematical and statistical techniques in order to solve problems in biology.

Administrative Staff

Director and Graduate Coordinator
Paul McNicholas (Department of Mathematics & Statistics, MacNaughton 517, Ext. 53136)
pmcnicho@uoguelph.ca

BINF Graduate Admissions Secretary
Karen White (3479 Science Complex, Ext. 52730)
cbograd@uoguelph.ca

Graduate Secretary
TBD (Department of Mathematics & Statistics, MacNaughton 517, Ext. 53136)
pmcnicho@uoguelph.ca

Graduate Faculty

Sarah J. Adamowicz
Assistant Professor, Integrative Biology

R. Ayesha Ali
Assistant Professor, Mathematics and Statistics

Emma Allen-Vercoe
Assistant Professor, Molecular and Cellular Biology

Daniel Ashlock
Professor, Mathematics and Statistics

Elizabeth Boulding
Professor, Integrative Biology

David Chiu
Professor, Computer Science

Brenda L. Coomber
Professor, Biomedical Sciences

Roy G. Danzmann
Professor, Integrative Biology

Michael J. Emes
Professor, Molecular and Cellular Biology and Dean of the College of Biological Science

Zeny Feng
Assistant Professor, Mathematics and Statistics

T. Ryan Gregory
Associate Professor, Integrative Biology

Cortland K. Griswold
Assistant Professor, Integrative Biology

Mehrdad Hajibabaei
Assistant Professor, Integrative Biology

George Harauz
Professor, Molecular and Cellular Biology

Andreas Heyland
Assistant Professor, Integrative Biology

Ronald Johnson
Associate Professor, Biomedical Sciences

Niel A. Karrow
Associate Professor, Animal and Poultry Science

Stefan C. Kremer
Associate Professor, Computer Science

Lewis Lukens
Associate Professor, Plant Agriculture

David W.L. Ma
Associate Professor, Human Health and Nutritional Sciences

Janet L. MacInnes
Professor, Pathobiology

Paul D. McNicholas
Associate Professor, Mathematics and Statistics

Rod Merrill
Professor, Molecular and Cellular Biology

David M. Mutch
Assistant Professor, Human Health and Nutritional Sciences

Annette Nassuth
Associate Professor, Molecular and Cellular Biology

K. Peter Pauls
Professor, Plant Agriculture

J. Andrew B. Robinson
Associate Professor and Chair, Animal and Poultry Science

Steven Rothstein
Professor, Molecular and Cellular Biology

Larry R. Schaeffer
Professor, Animal and Poultry Science

M. Alexander Smith
Assistant Professor, Integrative Biology

George van der Merwe
Associate Professor, Molecular and Cellular Biology

Master of Bioinformatics Program

Admission Requirements

Students may be admitted to the Master of Bioinformatics program from a range of undergraduate programs, including biology, statistics, mathematics, engineering or computer science. 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 and students must have taken at least one course in three or more of the following areas:

- Statistics
- Computer Programming
- Biology
- Mathematics

Applicants should briefly indicate their research interests and, if possible their preferred advisors.

There is no application deadline, but space in the program is limited. Most spaces are filled in March for entry the following September. Prospective students should check the program website for admission procedures and apply as early as possible.

English Proficiency

Students whose first language is not English must provide certification of English proficiency as explained in the Graduate Calendar, Section II. General Regulations, Subsection: Application for Admission.

Degree Requirements

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

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

The advisory committee may require additional courses. An average of 70% or better must be obtained in the prescribed courses. Further information may be obtained from the Director.

Advisory Committee

Students taking the Master of Bioinformatics will have two advisors: a member of graduate faculty from CPES and a member of graduate faculty from a College other than CPES.

Duration of the Program

Students normally take 3 courses per term for two terms (3.0 credits) and complete the Bioinformatics Master’s Project (1.0 credit) in a third term. The program typically takes 12 months of full-time study.

Master of Science Program

Admission Requirements

Students may be admitted to the MSc in Bioinformatics program from a range of undergraduate programs, including biology, statistics, mathematics, engineering or computer science. 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 and students must have taken at least one course in three or more of the following areas:

- Statistics
- Computer Programming
- Biology
- Mathematics

Applicants should briefly indicate their research interests and, if possible, their preferred advisors.

There is no application deadline, but space in the program is limited. Most spaces are filled in March for entry the following September. Prospective students should check the program website for admission procedures and apply as early as possible.

English Proficiency

Students whose first language is not English must provide certification of English proficiency as explained in the Graduate Calendar, Section II. General Regulations, Subsection: Application for Admission.
### Degree Requirements

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

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>BINF*6110</td>
<td>Genomic Methods for Bioinformatics</td>
<td>[0.50]</td>
</tr>
<tr>
<td>BINF*6210</td>
<td>Software Tools for Biological Data Analysis and Organization</td>
<td>[0.50]</td>
</tr>
</tbody>
</table>

The advisory committee may require additional courses. An average of 70% or better must be obtained in the prescribed 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. Further information may be obtained from the Director.

### Advisory Committee

Students taking the MSc in Bioinformatics will have an advisory committee of at least two graduate faculty members. The advisory committee will either:

- a. Have two advisors: a member of graduate faculty from CPES and a member of graduate faculty from a College other than CPES; or
- b. Have one advisor that is a member of graduate faculty from CPES and an advisory committee member

### Duration of the Program

Students normally take 2 courses per term for two terms (2.0 credits) while developing their thesis topic. Then they complete the Bioinformatics Master’s Thesis subsequent terms. The program typically takes 12-20 months of full-time study.

### Courses

#### Biological Sciences

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANSC*6370</td>
<td>Quantitative Genetics and Animal Models</td>
<td>[0.50]</td>
</tr>
<tr>
<td>IBIO*6060</td>
<td>Special Topics in Evolution</td>
<td>[0.50]</td>
</tr>
<tr>
<td>PLNT*6160</td>
<td>Advanced Plant Breeding II</td>
<td>[0.50]</td>
</tr>
<tr>
<td>PLNT*6500</td>
<td>Applied Bioinformatics</td>
<td>[0.50]</td>
</tr>
</tbody>
</table>

#### Computer Science

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit</th>
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</thead>
<tbody>
<tr>
<td>CIS*6060</td>
<td>Bioinformatics</td>
<td>[0.50]</td>
</tr>
<tr>
<td>CIS*6080</td>
<td>Genetic Algorithms</td>
<td>[0.50]</td>
</tr>
<tr>
<td>CIS*6120</td>
<td>Uncertainty Reasoning in Knowledge Representation</td>
<td>[0.50]</td>
</tr>
<tr>
<td>CIS*6420</td>
<td>Soft Computing</td>
<td>[0.50]</td>
</tr>
</tbody>
</table>

#### Mathematics and Statistics

<table>
<thead>
<tr>
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<th>Course Title</th>
<th>Credit</th>
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<tbody>
<tr>
<td>MATH*6071</td>
<td>Biomathematics</td>
<td>[0.50]</td>
</tr>
<tr>
<td>STAT*6801</td>
<td>Statistical Learning</td>
<td>[0.50]</td>
</tr>
<tr>
<td>STAT*6950</td>
<td>Statistical Methods for the Life Sciences</td>
<td>[0.50]</td>
</tr>
<tr>
<td>STAT*6960</td>
<td>Design of Experiments and Data Analysis for the Life Sciences</td>
<td>[0.50]</td>
</tr>
</tbody>
</table>

#### Bioinformatics

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>BINF*6110</td>
<td>Genomic Methods for Bioinformatics F [0.50]</td>
<td></td>
</tr>
<tr>
<td>BINF*6210</td>
<td>Software Tools for Biological Data Analysis and Organization F [0.50]</td>
<td></td>
</tr>
<tr>
<td>BINF*6410</td>
<td>Algorithms and Programming in Bioinformatics W [0.50]</td>
<td></td>
</tr>
</tbody>
</table>

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):** Instructor's Consent

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit</th>
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</thead>
<tbody>
<tr>
<td>BINF*6970</td>
<td>Statistical Bioinformatics W [0.50]</td>
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</tr>
</tbody>
</table>

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):** Instructor's Consent

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>BINF*6999</td>
<td>Bioinformatics Master's Project F,W,S [1.00]</td>
<td></td>
</tr>
</tbody>
</table>

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

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

**Restriction(s):** Instructor's Consent

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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 Secretary 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 three major fields: Reproductive Biology, Developmental, Cell and Tissue Morphology, and Biomedical Toxicology/Pharmacology. The department also participates in the Doctor of Veterinary Science (DVSc) program, co-ordinated by an interdepartmental committee chaired by the Associate Dean (graduate studies and research) of the Ontario Veterinary College.

Administrative Staff

Chair
Neil MacLusky (2633 Ontario Veterinary College, Ext. 54700)
nmaclusk@ovc.uoguelph.ca

Graduate Coordinator
Matt Vickaryous (2624 Ontario Veterinary College, Ext. 53871)
mvickary@uoguelph.ca

Graduate Secretary
Wendy Arthur (2633 OVC, Ext. 54900)
wartthur@ovc.uoguelph.ca

Graduate Faculty

Pawel M. Bartlelewski
DVM Poland, MSc, PhD Saskatchewan - Associate Professor

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

Brenda L. Coomber
BSc, MSc Guelph, PhD Toronto - Professor

Ann C. Hahnel
BA, BSc, PhD Washington - Associate Professor

W.J. Brad Hanna
BSc, DVM, MSc, PhD Guelph - Associate Professor

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

Bettina E. Kalisch
BSc, MSc, PhD Queen's - Associate Professor

W. Allan King
BSc, MSc Guelph, PhD Uppsala - Professor and Canada Research Chair, Tier 1

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

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

Jonathan LaMarre
DVM, PhD Guelph - Professor

Neil J. MacLusky
BSc, PhD London - Professor and Chair

Pavneesh Madan
BVSc & AH, MVSc Haryana, PhD British Columbia - Assistant Professor

Tami Martino
BSc McMaster, MSc PhD Toronto - Assistant Professor

Roger A. Moorehead
BSc, PhD McMaster - Associate Professor

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

James J. Petrik
BA, MA, PhD Western Ontario - Professor

W. Glen Pyle
BSc Guelph, PhD Tennessee - Associate Professor

Alastair J.S. Summerlee
BSc, BVSc, PhD, MRCVS Bristol - University President and Vice Chancellor

Jeffrey J. Thompson
BA Cambridge, MSc, PhD Toronto - Professor

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

Alicia Vilora-Petit
BSc, MSc Venezuela, PhD Toronto - Assistant Professor

Shigeto Yamashiro
DVM Kagoshima, MVSc Hokkaido, MSc Guelph, PhD Hokkaido - Associate Professor

MBS program

Students may focus their Master of Biomedical Sciences in one of the three major fields: Reproductive Biology, Developmental, Cell and Tissue Morphology, and Biomedical Toxicology/Pharmacology. The research project may involve: molecular, cellular or developmental aspects of tissue or animal differentiation and growth, physiological, morphological or biomechanical investigations of normal function or disease processes in a variety of organs and tissues, or pharmacological mechanisms related to therapy and drug toxicity.

Admission Requirements

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

Degree Requirements

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

MSc Program

Students may focus their MSc degree in one of the three major fields: Reproductive Biology, Developmental, Cell and Tissue Morphology, and Biomedical Toxicology/Pharmacology. The research project may involve: molecular, cellular or developmental aspects of tissue or animal differentiation and growth, physiological, morphological or biomechanical investigations of normal function or disease processes in a variety of organs and tissues, or pharmacological mechanisms related to therapy and drug toxicity.

Admission Requirements

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

Students must obtain at least an overall weighted average of ‘B’ in prescribed courses. The number of graduate course credits prescribed will not be fewer than 1.5 credits. Prescribed and additional courses are selected by the student in consultation with the student's advisor. 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 Reproductive Biology, Developmental Cell and Tissue Morphology or Biomedical Toxicology/Pharmacology. Wherever appropriate, students are encouraged to incorporate the methodologies of more than one of these fields into their research project. The PhD program is research based and provides instructional opportunities and experiences that are intended to develop the student’s ability to formulate hypotheses and design and execute experiments or to conduct observational studies.

Admission Requirements

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

Degree Requirements

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

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

DVM Program

The Department of Biomedical Sciences participates in the DVM 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 Programs

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 Programs

Neuroscience MSc/MBS/PhD

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

Toxicology MSc/PhD

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

Courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
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</thead>
<tbody>
<tr>
<td>BIOM*6060</td>
<td>Functional Neuroanatomy</td>
<td>0.50</td>
</tr>
<tr>
<td>BIOM*6070</td>
<td>Pregnancy, Birth and Perinatal Adaptations S</td>
<td>0.50</td>
</tr>
<tr>
<td>BIOM*6110</td>
<td>Advanced Microscopy for Biomedical Sciences</td>
<td>0.50</td>
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<tr>
<td>BIOM*6130</td>
<td>Vertebrate Developmental Biology</td>
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<tr>
<td>BIOM*6160</td>
<td>Cellular Biology</td>
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</tr>
<tr>
<td>Course Code</td>
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<td>Credits</td>
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<tr>
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<tr>
<td>BIOM*6190</td>
<td>Tissue Culture Techniques in Biomedical Sciences</td>
<td>0.50</td>
</tr>
<tr>
<td></td>
<td>An introduction to in vitro techniques examining aspects and principles of the</td>
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<tr>
<td></td>
<td>culture environment, isolation methods, propagation, characterization and</td>
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<tr>
<td></td>
<td>storage of cultured cells, gametes and embryos. Practical exercises and</td>
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</tr>
<tr>
<td></td>
<td>student assignments complement material presented in lecture and seminar</td>
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</tr>
<tr>
<td></td>
<td>format.</td>
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<tr>
<td>BIOM*6440</td>
<td>Biomedical Toxicology</td>
<td>0.50</td>
</tr>
<tr>
<td></td>
<td>The course examines chemical compounds injurious to animals and man, toxicity</td>
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<td></td>
<td>testing, teratogens, carcinogens, factors influencing toxicity, and toxic</td>
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<tr>
<td></td>
<td>drug interactions. The mechanism of action, metabolism, and principles of</td>
<td></td>
</tr>
<tr>
<td></td>
<td>antitodal treatment are also studied.</td>
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</tr>
<tr>
<td>BIOM*6480</td>
<td>Pharmacodynamics and Pharmacokinetics</td>
<td>0.50</td>
</tr>
<tr>
<td></td>
<td>This course describes drug absorption, distribution, biotransformation and</td>
<td></td>
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<tr>
<td></td>
<td>elimination in animals and human beings, and emphasizes factors which modify</td>
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<tr>
<td></td>
<td>drug behaviour. It integrates molecular mechanisms with physiological</td>
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<tr>
<td></td>
<td>processes and highlights the importance of receptors and second messengers</td>
<td></td>
</tr>
<tr>
<td></td>
<td>in cellular responses to pharmacologic agents.</td>
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</tr>
<tr>
<td>BIOM*6570</td>
<td>Biochemical Regulation of Physiological Processes</td>
<td>0.50</td>
</tr>
<tr>
<td></td>
<td>This course focuses on the regulation of vertebrate physiological processes,</td>
<td></td>
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<tr>
<td></td>
<td>such as electrolyte and water balance, temperature regulation, growth and</td>
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<tr>
<td></td>
<td>energy metabolism, by hormones and other biological regulators that act</td>
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<td></td>
<td>through cellular receptors and intracellular biochemical-control pathways.</td>
<td></td>
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<tr>
<td>BIOM*6600</td>
<td>Special Topics in Reproductive Biology and Biotechnology</td>
<td>0.25</td>
</tr>
<tr>
<td></td>
<td>Permits in-depth exploration of interdisciplinary aspects of biomedical</td>
<td></td>
</tr>
<tr>
<td></td>
<td>research. Topics such as inflammation, reproductive immunology and</td>
<td></td>
</tr>
<tr>
<td></td>
<td>neoplasia have been offered.</td>
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<tr>
<td>BIOM*6602</td>
<td>Special Topics in Reproductive Biology and Biotechnology</td>
<td>0.50</td>
</tr>
<tr>
<td></td>
<td>See BIOM*6601 above.</td>
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</tr>
<tr>
<td>BIOM*6610</td>
<td>Vascular Biology</td>
<td>0.50</td>
</tr>
<tr>
<td></td>
<td>An interdisciplinary course in which the interrelationships between vascular</td>
<td></td>
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<tr>
<td></td>
<td>proteins, cellular elements and the maintenance of vascular integrity are</td>
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<tr>
<td></td>
<td>examined. Structural-functional relationships in vascular biology are</td>
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</tr>
<tr>
<td></td>
<td>explored through seminar presentations, group discussions and small group</td>
<td></td>
</tr>
<tr>
<td></td>
<td>participation in problem based examples of vascular dysfunction.</td>
<td></td>
</tr>
<tr>
<td>BIOM*6701</td>
<td>Special Topics in Development, Cell and Tissue Morphology</td>
<td>0.25</td>
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<tr>
<td></td>
<td>Permits further in depth study of developmental and morphological sciences.</td>
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<tr>
<td>BIOM*6702</td>
<td>Special Topics in Development, Cell and Tissue Morphology</td>
<td>0.50</td>
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<tr>
<td></td>
<td>See BIOM*6701</td>
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<tr>
<td>BIOM*6711</td>
<td>Special Topics in Physiology &amp; Biochemistry</td>
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<tr>
<td></td>
<td>This course involves an appropriate combination of an experimental procedure</td>
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<tr>
<td></td>
<td>(or project), seminars, selected reading or a literature review outside the</td>
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<tr>
<td></td>
<td>thesis subject, developed according to the student's requirements.</td>
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<tr>
<td>BIOM*6712</td>
<td>Special Topics in Physiology &amp; Biochemistry</td>
<td>0.50</td>
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<tr>
<td></td>
<td>See BIOM*6711</td>
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<tr>
<td>BIOM*6721</td>
<td>Special Topics in Pharmacology-Toxicology</td>
<td>0.25</td>
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<tr>
<td></td>
<td>This course will comprise a combination of an experimental procedure (or</td>
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<tr>
<td></td>
<td>project), seminars, selected reading or a literature review outside the</td>
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<td></td>
<td>thesis subject, developed based on the student's requirements. Topics could</td>
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<tr>
<td></td>
<td>include clinical pharmacology/toxicology, pharmaco-epidemiology/economics,</td>
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<tr>
<td></td>
<td>gerontological or perinatal pharmacology and toxicokinetics. Department of</td>
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<tr>
<td></td>
<td>Biomedical Sciences</td>
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<tr>
<td>BIOM*6722</td>
<td>Special Topics in Biomedical Pharmacology-Toxicology</td>
<td>0.50</td>
</tr>
<tr>
<td></td>
<td>See BIOM*6721</td>
<td></td>
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<tr>
<td>BIOM*6800</td>
<td>Gene Expression in Health and Disease W</td>
<td>0.50</td>
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<tr>
<td></td>
<td>This course presents the molecular concepts of gene expression and the</td>
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<td></td>
<td>functional consequences of abnormal expression in pathological conditions.</td>
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<tr>
<td></td>
<td>The conceptual, methodological and applied aspects of gene expression will</td>
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<tr>
<td></td>
<td>be illustrated through student and faculty seminars, written reports, group</td>
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<tr>
<td></td>
<td>discussions, and debates.</td>
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</tr>
<tr>
<td></td>
<td>Restrictions: Instructor's signature required</td>
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</tr>
<tr>
<td>BIOM*6900</td>
<td>Research Project in Biomedical Sciences W,S,F</td>
<td>1.00</td>
</tr>
<tr>
<td></td>
<td>This course will be a lab-based, two-semester research project course for</td>
<td></td>
</tr>
<tr>
<td></td>
<td>students in the course-based MSc stream in Biomedical Sciences.</td>
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</tr>
</tbody>
</table>
Biophysics

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

Administrative Staff

**Director and Graduate Coordinator**
Hermann Eberl (Mathematics and Statistics, MACN Rm. 508, Ext. 52622)
BIG@uoguelph.ca

**Graduate Secretary**
Cynthia Cheeseman (Science Complex, 1310 (CPES Dean's Suite/BSc Academic Counselling Centre), Ext. 56176)
ccheesem@uoguelph.ca

**Graduate Faculty**

<table>
<thead>
<tr>
<th>Name</th>
<th>Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>Josef Ackerman</td>
<td>Professor, Integrative Biology</td>
</tr>
<tr>
<td>Madhur Anand</td>
<td>Associate Professor, Environmental Biology</td>
</tr>
<tr>
<td>France-Isabelle Auzanneau</td>
<td>Associate Professor, Chemistry</td>
</tr>
<tr>
<td>Christopher T. Bauch</td>
<td>Associate Professor, Mathematics and Statistics</td>
</tr>
<tr>
<td>Manfred Brauer</td>
<td>Associate Professor, Molecular and Cellular Biology</td>
</tr>
<tr>
<td>Leonid Brown</td>
<td>Associate Professor, Physics</td>
</tr>
<tr>
<td>David Chiu</td>
<td>Professor, Computing and Information Science</td>
</tr>
<tr>
<td>Marc Coppolino</td>
<td>Associate Professor, Molecular and Cellular Biology</td>
</tr>
<tr>
<td>James H. Davis</td>
<td>Professor, Physics</td>
</tr>
<tr>
<td>John Dawson</td>
<td>Associate Professor, Molecular and Cellular Biology</td>
</tr>
<tr>
<td>John R. Dutcher</td>
<td>Professor, Physics</td>
</tr>
<tr>
<td>Hermann Eberl</td>
<td>Associate Professor, Mathematics and Statistics</td>
</tr>
<tr>
<td>Douglas Fudge</td>
<td>Assistant Professor, Integrative Biology</td>
</tr>
<tr>
<td>Susan Glasauer</td>
<td>Assistant Professor, Land Resource Science</td>
</tr>
<tr>
<td>Todd Gillis</td>
<td>Assistant Professor, Integrative Biology</td>
</tr>
<tr>
<td>Steffen Graether</td>
<td>Assistant Professor, Molecular and Cellular Biology</td>
</tr>
<tr>
<td>Marc Habash</td>
<td>Assistant Professor, Environmental Biology</td>
</tr>
<tr>
<td>George Harauz</td>
<td>Professor, Molecular and Cellular Biology</td>
</tr>
<tr>
<td>Mark Hurtig</td>
<td>Professor, Clinical Studies</td>
</tr>
<tr>
<td>Matthew S. Kimher</td>
<td>Assistant Professor, Molecular and Cellular Biology</td>
</tr>
<tr>
<td>Cezar Khursigaru</td>
<td>Assistant Professor, Molecular and Cellular Biology</td>
</tr>
<tr>
<td>Stefan W. Kycia</td>
<td>Associate Professor, Physics</td>
</tr>
<tr>
<td>Vladimir Ladizhansky</td>
<td>Associate Professor, Physics</td>
</tr>
<tr>
<td>Joseph Lam</td>
<td>Professor, Molecular and Cellular Biology</td>
</tr>
<tr>
<td>Anna T. Lawnczak</td>
<td>Professor, Mathematics and Statistics</td>
</tr>
<tr>
<td>Michael I. Lindinger</td>
<td>Associate Professor, Human Health and Nutritional Sciences</td>
</tr>
<tr>
<td>Jacek Lipkowski</td>
<td>Assistant Professor, Molecular and Cellular Biology</td>
</tr>
</tbody>
</table>

Professor, Chemistry

Steven N. Liss
Professor, Environmental Biology

A. Rodney Merrill
Professor, Molecular and Cellular Biology

Michele Oliver
Associate Professor, Engineering

Joanne O'Meara
Associate Professor, Physics

K. Peter Pauls
Professor, Plant Agriculture

Peter Purshlow
Professor, Food Science

Glen Pyle
Assistant Professor, Biomedical Sciences

Frances J. Sharom
Professor, Molecular and Cellular Biology

Jeffrey J. Thomason
Professor, Biomedical Sciences

Jack T. Trevors
Professor, Environmental Biology

Lori A. Vallis
Assistant Professor, Human Health and Nutritional Sciences

Christopher Whitfield
Professor, Molecular and Cellular Biology

Robert Wickham
Assistant Professor, Physics

Alan Willms
Assistant Professor, Mathematics and Statistics

Janet M. Wood
Professor, Molecular and Cellular Biology

Rickey Y. Yada
Professor, Food Science

Simon Yang
Professor, Engineering

John Zettel
Assistant Professor, Human Health and Nutritional Sciences

MSc Program

Admission Requirements

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

Degree Requirements

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

PhD Program

Admission Requirements

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

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

Students in the PhD program will be under the guidance of an interdepartmental advisory committee. For students who completed the MSc degree in a program other than Biophysics at the University of Guelph, a total of 1.0 graduate course credits are required, one of which is 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

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Credit</th>
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<tbody>
<tr>
<td>BIOP*6000</td>
<td>Concepts in Biophysics W</td>
<td>0.50</td>
</tr>
<tr>
<td>BIOP*6010</td>
<td>Biophysics Seminar U</td>
<td>0.00</td>
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<tr>
<td>BIOP*6950</td>
<td>Advanced Topics in Biophysics U</td>
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<tr>
<td>PHYS*7510</td>
<td>Cellular Biophysics U</td>
<td>0.50</td>
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<tr>
<td>PHYS*7520</td>
<td>Molecular Biophysics U</td>
<td>0.50</td>
</tr>
<tr>
<td>PHYS*7540</td>
<td>Special Topics in Biophysics U</td>
<td>0.50</td>
</tr>
<tr>
<td>PHYS*7570</td>
<td>Special Topics in Biophysics U</td>
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Courses in Related Subjects:

Biomedical Sciences

<table>
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<tr>
<th>Course Code</th>
<th>Title</th>
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<tbody>
<tr>
<td>BIOM*6110</td>
<td>Advanced Microscopy for Biomedical Sciences</td>
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<tr>
<td>BIOM*6160</td>
<td>Cellular Biology</td>
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<tr>
<td>BIOM*6190</td>
<td>Tissue Culture Techniques in Biomedical Sciences</td>
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Chemistry

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<tbody>
<tr>
<td>CHEM*7360</td>
<td>Regulation in Biological Systems</td>
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<tr>
<td>CHEM*7370</td>
<td>Enzymes</td>
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<tr>
<td>CHEM*7380</td>
<td>Cell Membranes and Cell Surfaces</td>
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<tr>
<td>CHEM*7310</td>
<td>Selected Topics in Biochemistry</td>
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Computing and Information Science

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<tbody>
<tr>
<td>CIS*6050</td>
<td>Neural Networks</td>
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<td>CIS*6060</td>
<td>Bioinformatics</td>
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<tr>
<td>CIS*6080</td>
<td>Genetic Algorithms</td>
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<tr>
<td>CIS*6420</td>
<td>Soft Computing</td>
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Engineering

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<tr>
<td>ENGG*6070</td>
<td>Medical Imaging</td>
<td>0.50</td>
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<tr>
<td>ENGG*6130</td>
<td>Physical Properties of Biomaterials</td>
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<td>ENGG*6150</td>
<td>Bio-Instrumentation</td>
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<tr>
<td>ENGG*6560</td>
<td>Advanced Digital Signal Processing</td>
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Human Health and Nutritional Sciences

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<tr>
<td>HHNS*6200</td>
<td>Research Methods in Biomechanics</td>
<td>1.00</td>
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<tr>
<td>HHNS*6440</td>
<td>Nutrition, Gene Expression and Cell Signalling</td>
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Mathematics and Statistics

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<tr>
<td>MATH*6051</td>
<td>Mathematical Modelling</td>
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<tr>
<td>MATH*6071</td>
<td>Biomatematics</td>
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<tr>
<td>STAT*6761</td>
<td>Survival Analysis</td>
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<tr>
<td>STAT*6850</td>
<td>Advanced Biometry</td>
<td>0.50</td>
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<tr>
<td>STAT*6950</td>
<td>Statistical Methods for the Life Sciences</td>
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<tr>
<td>STAT*6960</td>
<td>Design of Experiments and Data Analysis for the Life Sciences</td>
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Molecular and Cellular Biology

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<tr>
<td>MCB*6310</td>
<td>Advanced Topics in Developmental and Cellular Biology</td>
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<tr>
<td>MCB*6320</td>
<td>Advanced Topics in Microbiology</td>
<td>0.50</td>
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<tr>
<td>MCB*6360</td>
<td>Advanced Topics in Biochemistry and Molecular Biology</td>
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<tr>
<td>MCB*6370</td>
<td>Protein Structural Biology and Bioinformatics</td>
<td>0.50</td>
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<tr>
<td>MCB*6380</td>
<td>Structure and Function of Biological Membranes</td>
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Physics

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<tr>
<td>PHYS*7010</td>
<td>Quantum Mechanics I</td>
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<td>PHYS*7020</td>
<td>Quantum Mechanics II</td>
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</tr>
<tr>
<td>PHYS*7040</td>
<td>Statistical Physics I</td>
<td>0.50</td>
</tr>
<tr>
<td>PHYS*7050</td>
<td>Statistical Physics II</td>
<td>0.50</td>
</tr>
</tbody>
</table>
Business Administration

Administrative Staff
If you have any enquiry pertaining to the MBA Program at the University of Guelph, please contact:
Associate Dean, Executive Programs
Sylvain Charlebois (905 MacKinnon Bldg., Ext. 56808)
sylvain.charlebois@uoguelph.ca
Manager, Executive Programs
Patti Lago (800 MacKinnon Bldg., Ext. 56607)
plago@uoguelph.ca
Joe Barth
Graduate Program Coordinator

Graduate Faculty
The MBA program is administered and managed by the College of Management and Economics (CME), 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 Business (in CME), the School of Hospitality and Tourism Management (in CME), the Department of Economics and Finance (in CME) and the Department of Marketing and Consumer Studies (in CME).

From the Department of Food, Agricultural and Resource Economics (OAC):
Andreas Boecker
MSc, PhD Kiel - Associate Professor
Maury E. Bredahl
BS, MS North Dakota State, PhD Minnesota - 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
Karl D. Meikle
BS Washington State, PhD Minnesota - Professor
Rakhal C. Sarker
BSc, MSc Bangladesh, PhD Guelph - Associate Professor
Richard Vyn
BSc Dorst College, MSc Alberta, PhD Guelph - Assistant Professor
Alfons J. Weersink
BSc Guelph, MSc Montana State, PhD Cornell - Professor

From the Department of Business (CME):
Ron Baker
BComm Sudbury, MBA Athabasca, PhD Birmingham - Assistant Professor
Michele Bowring
BA Queen’s, MBA York, PhD Leicester - Assistant Professor
Francesco Braga
DOTT Milan, PhD Guelph - Associate Professor
Michael Breward
BComm Queen’s, MBA, PhD McMaster - Assistant Professor
Nita Chinzer
BA York, MBA, PhD McMaster - Assistant Professor
Julia Christensen Hughes
BComm Guelph, MBA, PhD York - Professor and Dean, College of Management
Michael Cox
CD Naval Officer Program, MA Western Washington, PhD Union (Ohio), MCIM - Associate Professor
Elliott Currie
BA, MBA McMaster, CMA - Associate Professor
Rumina Dhalia
MBA, PhD York - Assistant Professor
Elizabeth Kurucz
BA McMaster, MIR Toronto, PhD York - Assistant Professor
Sean Lyons
BPA Windsor, MA, PhD Ottawa - Associate Professor
Sara Mann
BComm MBA McMaster, PhD Toronto - Associate Professor
Fred Pries
BMath Waterloo, MASC, PhD Waterloo, CA - Associate Professor and Interim Chair
Sandra Scott
BSc Toronto, MBA, McMaster - Assistant Professor
Ken Smith
BSc York, MBA, MSc, PhD, Toronto - Associate Professor and Dean, Executive Programs, College of Management and Economics
Erna van Duren
BA Waterloo, MSc, PhD Guelph - Professor
John Walsh
BA Thames Polytechnic, MBA, PhD Western Ontario - Professor
Agnes Zdanuk
BA Waterloo, MASC, PhD Waterloo - Assistant Professor

From the School of Hospitality and Tourism Management (CME):
Joe Barth
BSc Guelph, MBA Wilfrid Laurier, MPS, PhD Cornell - Associate Professor
Michael Breward, (joint appointment with the Department of Business)
BComm Queen’s, MBA McMaster, PhD McMaster - Assistant Professor
Hwan-Suk (Chris) Choi
BA Chung-Ang (Seoul, Korea), MTA George Washington, PhD Texas A&M - Associate Professor
Statia Elliot
BComm St. Mary’s, MA McMaster, PhD Carleton - Assistant Professor
Joan Flaherty
BA, MA, MSc, Guelph - Assistant Professor
Kerry Godfrey
BSc Victoria, MSc Surrey, PhD Oxford Brookes, MBA Leicester - Professor and Director
Jamie A. Gruman, (joint appointment with the Department of Business)
BA Concordia, MA Lakehead, PhD Windsor - Assistant Professor
Marion Joppe
BA Waterloo, MA, PhD Univ. d’Aix-Marseille III (France) - Professor and Research Chair
Stephen Lynch
BA, BEd Toronto, MA Duquesne, MSc California American, PhD Bradford (England) - Associate Professor
Donald J. MacLaurin
BSc Florida International, MSc Nevada (Las Vegas), PhD Kansas State - Associate Professor
Tanya MacLaurin
BSc, MSc, PhD Kansas State - Professor
Iain Murray
BComm, MSc Guelph, PhD Kansas State - Associate Professor
Geoffrey W. Smith
MBA Guelph, CHRP - Associate Professor
Michael von Massow
BA Manitoba, BSc, MSc Guelph, PhD McMaster - Assistant Professor

From the Department of Economics (CME)
Francis Tapon
MBA Columbia, MA & PhD Duke - Professor
Ilia Tsiakas
BA, MA York, PhD Toronto - Associate Professor

From the Department of Marketing and Consumer Studies:
Vinay Kanetkar
BArch, MArch, MSc, PhD UBC - Associate Professor
Jane Londerville
BSc, MBA Harvard - Associate Professor
Brent McKenzie
BA, Diploma in Business Administration, MBA, PhD Griffith University - Associate Professor

MBA Program

Admission Requirements
1. 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 at least three years of industry related experience including supervisory and managerial responsibility OR
2. In special circumstances, a student may be admitted under alternate criteria.
In some cases the admissions committee may ask for a Graduate Management Admissions Test (GMAT).
Program Overview
The MBA course of study 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. Currently, the industry concentrations available to students include Hospitality and Tourism Management, and Food and Agribusiness Management and Sustainable Commerce. Other industry concentrations are being discussed for future development.

The Guelph program involves a core group of courses that build and develop key managerial skills, courses that allow students to apply concepts and skills to management situations in their chosen industry, and course work is followed by industry-related research culminating in a major project or thesis. Case studies are widely used. Program prerequisites include relevant experience in the participant’s chosen industry.

Core Courses
Participants complete seven 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:

AGBU*6700 [0.50] Special Topics in Agribusiness Management
BUS*6130 [0.50] General Environment of Business
BUS*6180 [0.50] Financial and Managerial Accounting
BUS*6200 [0.50] Financial Management
HTM*6050 [0.50] Management Communications
HTM*6110 [0.50] Foundations of Leadership
HTM*6140 [0.50] Foundations of Human Resource Management
HTM*6150 [0.50] Research Methods for Managers
AGBU*6070 [0.50] Research Methods for Managers
HTM*6700 [0.50] Strategic Management
AGBU*6400 [0.50] Strategic Management

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

Working with faculty of CME and the Department of Food, Agricultural and Resource Economics, participants complete advanced courses related to the food and agribusiness sector:

AGBU*6100 [0.50] Food and Agribusiness Economics and Policy
AGBU*6120 [0.50] Marketing Management
AGBU*6510 [0.50] Managing Price Risk
HTM*6800 [0.50] Operations Management

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

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

HTM*6510 [0.50] Hospitality and Tourism Revenue Management
HTM*6300 [0.50] Hospitality and Tourism Marketing
HTM*6530 [0.50] Safety, Security and Risk Assessment in HTM
HTM*6550 [0.50] Managing Service Quality

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

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

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

BUS*3000 [0.50] Environmental Management and Governance
AGBU*6120 [0.50] Marketing Management /
HTM*6300 [0.50] Hospitality and Tourism Marketing
HTM*6590 [0.50] Organizational Theory and Design

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

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.
### Hospitality and Tourism Management

#### HTM*6050 Management Communications F [0.50]
Examination of the theory, function and practice of managerial communications with particular emphasis on developing communication strategies and skills.

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

#### HTM*6100 Foundations of Leadership F [0.50]
This course will enhance students' interpersonal skills, as well as their knowledge and understanding of the theory and research underlying effective team management and collaboration on an organization. Experiential approaches are used to enhance managerial skills.

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

#### HTM*6120 Special Topics in Hospitality Organizational Behaviour F,W,S [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):* CME Executive Programs students only

#### HTM*6130 Special Topics in Hospitality Organizational Behaviour F,W,S [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):* CME Executive Programs students only

#### HTM*6140 Foundations of Human Resource Management W [0.50]
This course examines the essential human resource management functions of planning, staffing, employee development, compensation, health and safety, labour relations, and legal compliance, in a variety of organizational settings.

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

#### HTM*6150 Research Methods for Managers F [0.50]
Students learn to formulate a research problem, undertake a literature review, and to select and use appropriate quantitative and qualitative techniques for the collection and analysis of relevant data. The course also promotes the use of the World Wide Web as an information resource.

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

#### HTM*6170 Hospitality and Tourism Economics and Policy U [0.50]
The course introduces participants to economic and government policy issues that impact the hospitality and tourism industry. The course provides a strategic framework for understanding the macroeconomic and policy environment that is shaped by multilateral institutions, government and the hospitality and tourism industry.

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

#### HTM*6220 Special Topics in Management Issues F,W,S [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):* CME Executive Programs students only

#### HTM*6300 Hospitality and Tourism Marketing F [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):* CME Executive Programs students only

#### HTM*6320 Special Topics in Hospitality Marketing F,W,S [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):* CME Executive Programs students only

#### HTM*6330 Special Topics in Hospitality Marketing F,W,S [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):* CME Executive Programs students only

#### HTM*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):* CME Executive Programs students only

#### HTM*6530 Safety, Security and Risk Assessment in HTM U [0.50]
This course profiles legal and managerial strategies, principles and operational procedures to minimize safety and security risks faced by the hospitality and tourism industries. Risk analysis and management, crisis management, liability management, and industry specific law provide the foundation for this course.

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

#### HTM*6550 Managing Service Quality S [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):* CME Executive Programs students only

#### HTM*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):* CME Executive Programs students only
### Business Administration

#### HTM*6600 International Tourism and Tourism Marketing F [0.50]
Analyzes the social, political and economic impacts of tourism on the world scene, as well as the global integration of tourism in today's society.

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

#### HTM*6620 Special Topics in Tourism F,W,S [0.50]
Advanced course for those specializing in tourism. Deals with theories of tourism generators, multi-markets, tourism multipliers, current and future trends, regulatory environments, and distributions systems.

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

#### HTM*6630 Special Topics in Tourism F,W,S [0.50]
Advanced course for those specializing in tourism. Deals with theories of tourism generators, multi-markets, tourism multipliers, current and future trends, regulatory environments, and distributions systems.

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

#### HTM*6700 Strategic Management U [0.50]
An integrative course which draws together the conceptual theories and models of the graduate program core. Utilizes conceptual, analytical, problem identification, and problem solving skills.

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

#### HTM*6800 Operations Management U [0.50]
This course applies operations research theory and practices to management problem solving and decision-making. The focus is on modelling service and product delivery systems and major emphasis is placed on managerial problems in hospitality, tourism, and food and agribusiness organizations.

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

#### HTM*6900 Major Paper F,W,S [0.50]
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):** CME Executive Programs students only

### Business

#### BUS*6130 General Environment of Business W [0.50]
The objective of this course is to assist managers to better understand and develop strategies for dealing with their political and economic environments. This course has a comprehensive and international perspective that looks at how Canadian industries and businesses are part of a worldwide economics and political system. This course provides a detailed examination of how specific policies affect business and strategy in different industries for different commodities.

**Restriction(s):** CME Executive Programs Students

#### BUS*6180 Financial and Managerial Accounting F [0.50]
This course emphasizes the gathering and use of financial information to facilitate effective financial and management decisions. Cases are used to approach the subject from the perspective of the user of accounting information rather than that of the supplier.

#### BUS*6200 Financial Management W [0.50]
This course takes the viewpoint of the senior financial officer of a commercial enterprise. The focus is on the management of cash, accounts receivable, inventories and capital assets, as well as on the sourcing of funds through short-term liabilities, long-term debt and owners' equity.

**Prerequisite(s):** BUS*6180

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

#### 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.

#### BUS*6800 Readings in Leadership I F,W,S [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)

#### BUS*6810 Readings in Leadership II F,W,S [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)

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**Courses in Other Programs**

Various programs offer other courses that may be used to fulfill graduation requirements. These programs include agricultural economics, computing and information science, economics, philosophy, psychology, mathematics and statistics, sociology, rural planning and development. Students should discuss changes in the typical program with the graduate coordinator or their advisor prior to final course selection.
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 adult learning and development, communication, leadership, decision-making, facilitation as well as capacity building at individual, organizational and systems levels support the field of Capacity Development and Extension.

Administrative Staff

Director, SEDRD
Wayne Caldwell (101 Landscape Architecture, Ext. 56420) wcaldwel@uoguelph.ca

Graduate Coordinator
Al Lauzon (145 Landscape Architecture, Ext. 53379) alauzon@uoguelph.ca

Graduate Secretary
Sue Hall (100 Landscape Architecture, Ext. 56780) sshall@uoguelph.ca

Graduate Faculty

Glen C. Filson
BA, MEd Saskatchewan, PhD Toronto - Professor

Helen Hambley Odame
BA Toronto, M.E.S., PhD York - Associate Professor

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

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

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, communication technologies and international extension programs. A variety of learning formats are offered by the program including independent study, distance education, seminars, international courses and research colloquia.

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

Admission Requirements

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

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

Degree Requirements

A minimum of two full-time semesters of course work, or equivalent, must be completed. Thesis and Major Paper options are available.

All students enrolled in this field are required to complete a Thesis or a Major Research Paper, and a set of core courses that provide a foundation for capacity development and extension research and practice.

For the Major Paper option, these consist of:

CDE*6900 [1.00] Major Research Paper
CDE*6070 [0.50] Foundations of Capacity Building and Extension
CDE*6260 [0.50] Research Design
EDRD*6000 [0.50] Qualitative Analysis in Rural Development
OR
RPD*6380 [0.50] Application of Quantitative Techniques in Rural Planning and Development

In addition, for the Major Paper option, students are required to complete a minimum of four (4) restricted elective courses.

For the Thesis option, these consist of:

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

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

In addition, for the Thesis option, students are required to complete a minimum of two (2) restricted elective courses.

Students select an advisor and a research committee who will assist them in course selection, research and thesis development.

Interdepartmental Programs

Rural Studies PhD
Capacity Development and Extension participates in the PhD program in Rural Studies in the field of sustainable rural communities. Those faculty whose research and teaching expertise includes aspects of rural studies may serve as advisors for PhD students. For further information consult the Rural Studies listing in this calendar.

Collaborative Programs

International Development Studies
Capacity Development and Extension participates in the collaborative International Development Studies (IDS) program. 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 program 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 program including the special additional requirements for each of the participating departments.

Courses

Core Courses

CDE*6070 Foundations of Capacity Building and Extension U [0.50]
Contemporary issues and changes in rural communities and the implications for building community capacity. Students will be introduced to and examine dominant paradigms of community capacity building for meeting rural needs.

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.

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's signature required.

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

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.

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.

Prerequisite(s): CDE*6070

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.

CDE*6330 Facilitation and Conflict Management U [0.50]
Explore the theories of leadership, practice leadership skills and activities, and develop an understanding of the role facilitation and conflict management play in organizational success. Emphasizes personal individual development through practice, lecture and group discussion. Service learning through facilitation of community meetings will be part of the course.

Restriction(s): Instructor's signature required

CDE*6410 Readings in Capacity Building and Extension U [0.50]
A program of supervised independent study related to the student's area of concentration.

Restriction(s): Instructor's signature required.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Description</th>
<th>Restriction(s)</th>
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<tbody>
<tr>
<td>CDE*6420</td>
<td>Communication for Social and Environmental Change U [0.50]</td>
<td></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's signature required</td>
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<tr>
<td>CDE*6690</td>
<td>Community Environmental Leadership F [0.50]</td>
<td></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's signature required</td>
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IX. Graduate Programs, Chemistry

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 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, inorganic, nanoscience, organic, physical, theoretical (also chemical physics) and polymer chemistry, and biochemical or biological 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
Paul Rowntree (129 MacNaughton, Univ. of Guelph, (519) 824-4120, Ext. 58127)
gwc@uoguelph.ca

Secretary to the Director
Kim Rawson (2508 Science Complex, Univ. of Guelph, (519) 824-4120, Ext. 53848)
gwc@uoguelph.ca

Chair of the Department at Guelph
Adrian L. Schwan (2515 Science Complex, Ext. 53061)
sschwan@uoguelph.ca

Departmental Graduate Coordinator
Aziz Houmam (123 MacNaughton, Ext. 56429)
ahoumam@uoguelph.ca

Departmental Graduate Secretary
Karen Ferraro (2513 Science Complex, Ext. 53044)
chemgrad@uoguelph.ca

Graduate Faculty

France-Isabelle Auzanneau
Maitrise, DEA, PhD Paris XI-Orsay - Associate Professor

Mark Baker
BSc Sussex, MSc, PhD East Anglia - Professor and Graduate Co-ordinator

Michael K. Denk
Dipl. Ludwig-Maximilians, PhD Munich - Associate Professor

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

John D. Goddard
BSc Western Ontario, MSc, PhD Toronto - Professor

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

Lori Jones
BSc New Brunswick, PhD Guelph - Assistant Professor

Jacek Lipkowski
MSc, PhD, DSc Warsaw - Professor

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

Mario A. Monteiro
BSc, PhD York University - Assistant Professor

Glenn H. Penner
BSc, MSc, PhD Manitoba - Associate Professor

Kathryn E. Preuss
BSc Lethbridge, PhD Waterloo - Assistant Professor

Paul A. Rowntree
BSc, MSc Waterloo, PhD MA Princeton - Professor, Director of the Electrochemical Centre, Director of Guelph-Waterloo Centre

Marcel Schlaf
Diplom Bayerische Julius-Maximilian Universitat, PhD Toronto - Associate Professor

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

Dmitry V. Soldatov

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

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

J. Michael Chong
BSc, PhD British Columbia - Professor

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

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

Gary I. Dimitrienko
BSc, PhD Toronto - Associate Professor

Jean Duhamel
BEng, MSc, PhD (ENSIC, Nancy, France) - Professor and Canada Research Chair

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

Mario Gauthier
BSc, PhD McGill - Professor

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

Bruce M. Greenberg
BSc California (Berkeley), PhD Colorado (Boulder) - Professor

J. Guy Guillemette
BSc, PhD Toronto - Associate Professor and Graduate Officer

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

John F. Honek
BSc, PhD McGill - Professor and Chair

Scott Hopkins
BSc, PhD New Brunswick - Assistant Professor

Jamie W. Joseph
BSc Western, MSc, PhD Toronto - Assistant Professor

Vassili Karanassios
BSc Thessaloniki, PhD Alberta - Professor

Mikko Karttunen
BSc Westfalisiche-Universitat Munster, PhD Johannes-Gutenburg Universitat Mainz - Professor and Canada Research Chair

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

Robert J. LeRoy
BSc, MSc Toronto, PhD Wisconsin - University Professor

K. Tong Leung
BSc, PhD British Columbia - Professor

Jeuwen Liu
BS Science and Technology (China), PhD Illinois (Urbana-Champagne) - Assistant Professor

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

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

Elizabeth M. Meiering
BSc Waterloo, PhD Cambridge - Associate Professor and Associate Dean, Graduate Studies

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

Graham K. Murphy
BSc, (CVictoria), PhD (Alberta) - Assistant Professor

Linda F. Nazar
PhD Program

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

A student who is registered in (GWC)2 as a master's candidate may be permitted under certain circumstances to transfer to a PhD degree without writing an MSc thesis. The following guidelines are used in deciding whether a student will be recommended to the appropriate university authorities to transfer directly to the PhD program.

- The request must be initiated by the student no later than the end of the third semester in the MSc program. Transfers will be made no later than the fourth semester.
- The applicant should have a superior academic record at both the undergraduate and graduate level, with a first class standing and above average performance in a minimum of two graduate courses and MSc Seminar, CHEM*7940.
- The applicant must have demonstrated an oral and written communication ability appropriate for a PhD-level student, and there must be clear evidence of research productivity and promise.
- The request for direct transfer should be accompanied by supporting documentation from the advisor, the advisory committee, and another faculty member familiar with the student's research record.

PhD Co-operative Option

A student is encouraged to apply to the PhD co-operative option if he/she has an honours bachelor of science degree, or the equivalent, with a minimum overall A standing.

Degree Requirements

PhD Program

Students in the PhD program must successfully complete three semester-long courses beyond those required for the master of science degree. One of these courses will be PhD Seminar, CHEM*7950. Students must also pass an oral qualifying examination, CHEM*7960, in their major field, and submit and defend an acceptable thesis.

Students admitted directly to the PhD program from a BSc must successfully complete one semester-long course beyond those required for the master of science degree. In addition, students must also complete CHEM*7950 (PhD Seminar), pass an oral qualifying examination, CHEM*7960, in their major field, and submit and defend an acceptable thesis.

PhD Co-operative Option

Students registered in the PhD program may proceed to that degree under the co-operative option. Under this option one of the two required one-term courses, in addition to CHEM*7950 and CHEM*7960, must be completed within the first two academic semesters of study in the centre. After successful completion of these two semesters of course work, the candidate will spend three semesters (one year) working in an industrial or government laboratory. On completion of the work year, a student will be required to submit a work report which will be evaluated by the centre and the career services unit at the student's home campus. Following successful completion of the work year, the student will return to the centre to continue work on a PhD research project and complete the regular PhD requirements.

Collaborative Programs

Toxicology MSc/PhD

The Department of Chemistry participates in the MSc/PhD program in toxicology. Please consult the Toxicology listing for a detailed description of the MSc/PhD collaborative program. Students choosing this option must meet the requirements of the toxicology collaborative program, 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

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<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>CHEM*7100</td>
<td>Selected Topics in Inorganic Chemistry U</td>
<td>[0.50]</td>
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</table>

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.
IX. Graduate Programs, 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.

**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.

**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.

**CHEM*7170 Advanced Transition Metal Chemistry U [0.50]**
Magnetochemistry of transition metal compounds. Electronic spectra of complex ions including applications of molecular orbital and ligand field theories. Stabilization of unusual oxidation states and co-ordination numbers. Bonding, structure and reactivity of certain important classes of metal complexes, e.g., metal hydrides, metal-metal bonded species, biologically significant model systems such as macrocycles.

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

**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.

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

**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.

**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 (HPLC, CPC, IEC), supercritical fluid (SFC) chromatographies; GC-MS, CG-FTIR; electrophoresis, flow field fractionation. Prerequisites: undergraduate level course in instrumental analysis.

**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 chronopotentiometry, chronocoulometry, polarography, voltammetry, chronopotentiometry, coulometric titrations, flow techniques, electrochemical sensors and chemically modified electrodes.

**CHEM*7290 Surface Analysis U [0.50]**

**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.

**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 of Chemistry

**CHEM*7360 Regulation in Biological Systems U [0.50]**

**CHEM*7370 Enzymes U [0.50]**

**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.

**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.

**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.

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

**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.

**CHEM*7550 Kinetics - Dynamics U [0.50]**

**CHEM*7560 Spectroscopy U [0.50]**
Aspects of electronic vibrational and rotational spectroscopy of atoms, molecules, and the solid state. Relevant aspects of quantum mechanics, Dirac notation, and angular momentum will be discussed. Group Theory will be presented and its implications for spectroscopy introduced. Prerequisites: one semester-long undergraduate course in quantum mechanics or the approval of the instructor.

**Organic**

**CHEM*7600 Selected Topics in Organic Chemistry U [0.50]**
Two or three topics from a range including: bio-organic chemistry; environmental organic chemistry; free radicals; heterocyclic molecules; molecular rearrangements; organometallic chemistry; photochemistry; natural products. Department of Chemistry

**CHEM*7640 Synthetic Organic Reactions U [0.50]**
Named organic reactions and other synthetically useful reactions are discussed. The mechanism, stereochemical implications and use in organic synthesis of these reactions will be presented. Examples from the organic literature will be used to illustrate these aspects.

**CHEM*7650 Strategies in Organic Synthesis U [0.50]**
The synthesis of organic compounds is discussed and emphasis is placed on the design of synthetic routes. Examples drawn from the literature are used to illustrate this synthetic planning. Prerequisite(s): CHEM*7640

**CHEM*7660 Organic Spectroscopy U [0.50]**
Ultraviolet, infrared, resonance spectroscopy and mass spectrometry, with emphasis on applications to studies of organic molecules.

**CHEM*7690 Physical Organic Chemistry U [0.50]**
Linear free energy relationships; substituent effects and reactive intermediates.
### Polymer

**CHEM*7700 Principles of Polymer Science U [0.50]**
Introduction to the physical chemistry of high polymers, principles of polymer synthesis, mechanisms and kinetics of polymerization reactions, copolymerization theory, polymerization in homogeneous and heterogeneous systems, chemical reactions of polymers. Theory and experimental methods for the molecular characterization of polymers.

**CHEM*7710 Physical Properties of Polymers U [0.50]**
The physical properties of polymers are considered in depth from a molecular viewpoint. Rubber elasticity, mechanical properties, rheology and solution behaviour are quantitatively treated.

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

**CHEM*7720 Polymerization and Polymer Reactions U [0.50]**
The reactions leading to the production of polymers are considered with emphasis on emulsion and suspension polymerization and polymerization reaction engineering. Polymer degradation, stabilization and modification reactions are also considered in depth.

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

**CHEM*7730 Selected Topics in Polymer Chemistry U [0.50]**
Discussion of specialized topics of polymer chemistry related to the research interests of the faculty or prominent scientific visitors. Special topics could include, for example: polymer stabilization and degradation; mechanical properties; polymer principles in surface coatings; organic chemistry of synthetic high polymers; estimation of polymer properties; reactions of polymers; polymerization kinetics.

### Research

**CHEM*7940 MSc Seminar U [0.50]**
A written literature review and research proposal on the research topic will be presented and defended in a 30-minute public seminar. This requirement is to be completed by all thesis-option MSc students within two semesters of entering the program.

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

**CHEM*7960 Comprehensive Examination U [0.00]**
PhD students are required to take an oral examination in their major field. The specific content and format are specified by a centre examining committee. The examination must be first attempted no later than eight months after entering the regular PhD program. For co-op PhD students, the examination must be first attempted no later than four months after their return from the work year.

**CHEM*7970 MSc Research Paper U [0.50]**
An experimental project normally based on the CHEM*7940 research proposal, supervised by the advisor, taking three to four months to complete. This project may be completed at any time during the student's program, but it must follow CHEM*7940. A written report is required, and a seminar based on the content of the report will be presented. The report must be completed as per the project/thesis guidelines of the University campus on which the student is registered. This course normally will follow the course CHEM*7940 MSc Seminar.

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

**CHEM*7990 PhD Thesis U [0.00]**
Clinical Studies

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

Administrative Staff

Acting Chair
Carolyn Kerr (1436 OVC, Ext. 54051)
ckerr@uoguelph.ca

Graduate Coordinator
Dr. Laurent Viel (1302/1303 OVC, Ext. 54067)
lveil@uoguelph.ca

Graduate Secretary
Deyna Dinesen (1439 OVC, Ext. 54005)
ddinesen@uoguelph.ca

Graduate Faculty

Luis Arroyo
DVM Nacional, DVSc, PhD Guelph - Assistant Professor

Lance Bassage
BA, VMD Pennsylvania, Dipl. ACVS - Assistant Professor

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

Shauna Blois
BSc, DVM Prince Edward Island, DVSc Guelph, Dipl. ACVIM - Assistant Professor

Sarah Boston
DVM Saskatchewan, DVSc Guelph, Dipl. ACVS - Assistant Professor

Brigitte Brisson
DVM Montreal, DVSc Guelph, Dipl. ACVS - Associate Professor

Nicolae Cribb
VetMB, MA Cambridge, DVSc Guelph, Dipl. ACVS - Assistant Professor

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

Thomas Gibson
BSc Guelph, BEdu Windsor, DVM, DVSc Guelph, Dipl. ACVIM - Assistant Professor

Joanne Hewson
DVM, PhD Guelph, Dipl. DACVIM (LA) - Assistant Professor

Marie Holowaychuk
DVM Saskatchewan, Dipl. ACVECC - Assistant Professor

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

Fiona James
HBSc Toronto, DVM, DVSc Guelph, MSc Western, - Assistant Professor

Carolyn L. Kerr
DVM, DVSc Guelph, PhD Western, Dipl. ACVA - Associate Professor and Chair

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

Noel Moens
DVM Liege (Belgium), MSc Saskatchewan, Dipl. ACVS/ECVS - Associate Professor

Anthony Mutsaers
DVM Guelph, PhD Toronto - Assistant Professor

Stephanie Nykamp
DVM, Dipl ACVR - Associate Professor

Anthony C.G. Ogg
BA Alberta, DVM Saskatchewan, DVSc Guelph, Dipl. ACVIM - Associate Professor

Lynee O’Sullivan
DVM Prince Edward Island, DVSc Guelph, Dipl. ACVIM - Associate Professor

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

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

Amet Singh
BSc Mount Allison, DVM Atlantic Veterinary College, DVSc Guelph - Assistant Professor

Laura L. Smith-Maxie
DVM, MSc Guelph - Professor

Henry Stuempfli
DVM, Dr. Med. Vet. Bern, Dipl. ACVIM - Professor

Elizabeth A. Stone
BA Scripps College, DVM California (Davis), MS Georgia, MPP Duke - Dean, Ontario Veterinary College

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

Alexander Valverde
DVSc Program

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

Adronie Verbrugghe
DVM, PhD Ghent - Assistant Professor

Laurent Viel
DVSc Program

DVM Montreal, MSc, PhD Guelph - Professor

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

Anthony Yu
BSc, DVM Guelph, MS Auburn, Dipl. ACVD - Associate Professor

MSc Thesis Program

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

Master of Science positions are generally not funded by the researcher. Qualified applicants need to provide their own living expenses and tuition funds, or obtain a scholarship or sponsorship by an organization. The program involves a minimum of 3 courses, a research project and writing of a thesis. We do not offer a clinical Master of Science program.

Admission Requirements

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

Degree Requirements

Candidates are required to carry out an independent experimental study and produce a thesis. Three graduate level courses are required.

MSc Course-work Program

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

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

Admission Requirements

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

Degree Requirements

See above.

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, leading to 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 for licensure 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.

May 13, 2014 2012-2013 Graduate Calendar
Admission Requirements

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

Degree Requirements

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

Graduate Diploma Program

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

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

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

Admission Requirements

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

Diploma Requirements

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

Collaborative Program

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

Courses

Medicine

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<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>CLIN*6010</td>
<td>Clinical Medicine F [0.50]</td>
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<tr>
<td>CLIN*6030</td>
<td>Clinical Medicine W [0.50]</td>
<td></td>
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<tr>
<td>CLIN*6031</td>
<td>Clinical Medicine S [0.50]</td>
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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 commonly occurring in the Fall (F), Winter (W), and Summer (S) semesters respectively.

Surgery

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<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>CLIN*6170</td>
<td>Clinical Surgery F [0.50]</td>
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</table>

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.

Restrictions: Instructor's signature required.

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.
General

CLIN*6900 Clinical "Grand Rounds" Seminar F-W [0.25]
This course allows each participant the opportunity to present a clinical case to colleagues in the veterinary school. The topic must be approved by the course co-ordinator. The oral presentation will be evaluated, as will the written presentation, which should be in a form suitable for submission to a veterinary journal.

CLIN*6920 Veterinary Clinical Practice I F [0.50]
These are in-service clinical training courses for intern/graduate-diploma students based on case material presented to the Veterinary Teaching Hospital. Under supervision, the intern/graduate-diploma student, as part of a service team with a faculty clinician, is expected to hone his/her diagnostic, therapeutic and surgical skills, and gain experience with animal restraint and nursing care. They will also develop a problem-oriented approach to health management and disease. Case material studied in each course reflects the clinical problems commonly occurring in the Fall, Winter and Summer semesters respectively.

Restriction(s): Instructor's Consent Required

CLIN*6930 Veterinary Clinical Practice II W [0.50]
These are in-service clinical training courses for intern/graduate-diploma students based on case material presented to the Veterinary Teaching Hospital. Under supervision, the intern/graduate-diploma student, as part of a service team with a faculty clinician, is expected to hone his/her diagnostic, therapeutic and surgical skills, and gain experience with animal restraint and nursing care. They will also develop a problem-oriented approach to health management and disease. Case material studied in each course reflects the clinical problems commonly occurring in the Fall, Winter and Summer semesters respectively.

Restriction(s): Instructor's Consent Required

CLIN*6940 Veterinary Clinical Practice III S [0.50]
These are in-service clinical training courses for intern/graduate-diploma students based on case material presented to the Veterinary Teaching Hospital. Under supervision, the intern/graduate-diploma student, as part of a service team with a faculty clinician, is expected to hone his/her diagnostic, therapeutic and surgical skills, and gain experience with animal restraint and nursing care. They will also develop a problem-oriented approach to health management and disease. Case material studied in each course reflects the clinical problems commonly occurring in the Fall, Winter and Summer semesters respectively.

Restriction(s): Instructor's Consent Required

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

CLIN*6990 Project in Clinical Studies F,W,S [0.50]
This course allows each participant the opportunity to present a clinical case to colleagues in the veterinary school. The topic must be approved by the course co-ordinator. The oral presentation will be evaluated, as will the written presentation, which should be in a form suitable for submission to a veterinary journal.

Animesthesia

CLIN*6420 Anesthesiology I S [0.50]
A course in advanced veterinary anesthesiology and allied topics such as fluid, acid-base, and electrolyte balance, shock therapy, and cardio pulmonary resuscitation.

CLIN*6440 Anesthesiology II F,W,S [0.50]
A discussion, reading and investigative course on research methods in comparative anesthesiology.

Restriction(s): CLIN*6420 is normally a prerequisite

CLIN*6460 Anesthesiology III: Species Specific and Coexisting Disease Considerations F-W [0.50]
A course in advanced veterinary anesthesiology that focuses on the scientific literature related to the anesthesiology of specific species and veterinary patients with varying underlying diseases.

Restriction(s): DVM; CLIN*6420 and CLIN*6440

Radiology

CLIN*6330 Advanced Principles of Diagnostic Imaging U [0.50]
This course is intended for students pursuing a career in veterinary radiology. Using a lecture-discussion format, the science of x-ray production and the fundamentals of other diagnostic imaging modalities will be presented. The specific applications of these techniques to research and clinical situations will be investigated.

CLIN*6350 Advanced Radiology I F,W,S [0.50]
Radiographic changes seen in diseases of the thorax and abdomen are demonstrated by using radiographs. Contrast and special studies are included where applicable.

CLIN*6370 Advanced Radiology II F [0.50]
A continuation of CLIN*6350, covering radiographic abnormalities of the neurological and skeletal systems.
Computer Science

The School of Computer Science offers a program of study leading to the MSc and PhD in Computer Science degrees.

Administrative Staff

Director
Stefan Kremer (222 Reynolds, Ext. 58913)
director@socs.uoguelph.ca

Graduate Coordinator
Gary Grewal (306 Reynolds, Ext. 52939)
gradchair@socs.uoguelph.ca

Graduate Secretary
Consuelo Goegan (216 Reynolds, Ext. 52630)
gradsec@socs.uoguelph.ca

Graduate Faculty

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

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

William Gardner
BSEE MIT, BE(T)oronto, PhD Victoria - Associate Professor

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

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

Xining Li
BSc, MSc Nanjing, PhD Calgary - Professor

Quzay H. Mahmoud
BSc, MSc New Brunswick, PhD Middlesex - 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. Ohimbo
MSc Kiev, PhD New Brunswick - Associate Professor

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

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

Deborah A. Stacey
BSc Guelph, MASc, PhD Waterloo - Associate Professor and Director

Fangju Wang
BE Changsha, MSc Peking, PhD Waterloo - Professor and Graduate Coordinator

Mark Wineberg
BSc Toronto, MSc, PhD Carleton - Associate Professor

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

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

MSc in Computer Science Program

The MSc program emphasizes research that can potentially contribute to industry and government. The School of Computer Science (SOGS) offers the MSc degree in Computer Science in the fields of applied modelling, artificial intelligence, distributed computing, and human computer interaction as detailed below:

1. **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.

2. **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, datamining, pattern recognition, intelligent agents.

3. **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.

4. **Human Computer Interaction (HCI)**: Students working in this field will engage in research on topics context-aware systems, usability, interface design, mobile and ubiquitous computing.

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 SOCS 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 SOCS, including at least a 75% average during the previous two years of full-time university study for a degree.

Course Requirement

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

(A) Seven prescribed courses:

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

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

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

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

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

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

**English Proficiency**

A test of English proficiency is required of all applicants whose first language is not English. Required scores are shown below:

- Paper-based TOEFL- 600.
- Internet-based TOEFL- 100, 26 speaking and writing, 21 reading and listening.
- IELTS- 7.5.
- MELAB- 90, speaking 3, no score lower than 80.
- CAEL- 70 overall, 70 writing and speaking, no score lower than 60.
- University of Guelph English Language Certificate at the Advanced Level.

The proof of English proficiency requirement may be waived in exceptional circumstances (e.g., applicants who have studied full-time for two years in a country where English is the native language AND in a university where English is the language of instruction). Graduate Committee approval required.

**Degree Requirements**

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

- Completion of the Technical Communication and Research Methodology course (CIS*6890) and at least four other graduate courses
- An accepted thesis.
- Completion of the seminar requirement.
- An accepted thesis.

There is no qualifying exam or second-language requirement. Supplementary program information is available to students via the SOCS website [http://www.socs.uoguelph.ca/](http://www.socs.uoguelph.ca/)

**Duration of the Program**

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 in the program assuming adequate preparation for graduate work. Normally, students are expected to fulfill all the requirements in six semesters.

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

**Thesis Defence**

Arrangements for the MSc thesis defence should be made at least 4 weeks prior to the anticipated date of the defence, and the student must submit his/her MSc thesis to the Examination Committee at least 2 weeks prior to the defence. The examination consists of an oral presentation by the student followed by questions from the Examination Committee.

**PhD in Computer Science Program**

The School of Computer Science (SOCS) offers the PhD degree in Computer Science in the fields of applied modelling, artificial intelligence, distributed computing, and human computer interaction as detailed below:

1. **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.

2. **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, datamining, pattern recognition, intelligent agents

3. **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.

4. **Human Computer Interaction (HCI):** Students working in this field will engage in research on topics context-aware systems, usability, interface design, mobile and ubiquitous computing.

**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 SOCS website http://www.socs.uoguelph.ca for admission procedures and deadlines.

**General Requirements**

Admission to the PhD program will normally require a recognized master's degree in Computer Science or a closely related discipline obtained with high academic standing. Entrants are expected to have previously studied the following areas in Computer Science:

- Advanced Programming
- Computer Architecture
- Data Structures
- Operating Systems
- Databases
- Software Engineering
- Discrete Mathematics
- Algorithms
- Computer Networks

and the following areas in Mathematics and Statistics:

- Calculus
- Linear Algebra
- Probability and Statistics
- Numerical Analysis

Students who lack sufficient breadth may be required to complete specific courses as a condition of admission. Students entering the program are expected to have demonstrated good research potential, an ability to critically evaluate experimental or theoretical results, and strong communication skills. Evidence for these are normally provided by scholarly publications during and immediately following the master's degree.

**English Proficiency**

A test of English proficiency is required of all applicants whose first language is not English. Required scores are shown below:

- Paper-based TOEFL - 600.
- Internet-based TOEFL - 100, 26 speaking and writing, 21 reading and listening
- IELTS - 7.5.
- MELAB - 90, speaking 3, no score lower than 80.
- CAEL - 70 overall, 70 writing and speaking, no score lower than 60.
- University of Guelph English Language Certificate at the Advanced Level.

The proof of English proficiency requirement may be waived in exceptional circumstances (e.g., applicants who have studied full-time for two years in a country where English is the native language AND in a university where English is the language of instruction). Graduate Committee approval required.

**GRE Tests**

Students who have obtained a Masters degree from a university outside of Canada are encouraged to supply GRE scores (GRE General and/or GRE Subject in CS).

**Admission without an MSc Degree**

A student who has achieved excellent standing in an honours Computer Science degree (or an equivalent 4-year Computer Science degree) and who wishes to proceed to doctoral study may enrol, in the first instance, in the MSc program. If the student achieves a superior academic record and shows a particular aptitude for research, the student may be transferred into the PhD program without completing the MSc degree. The application for transfer must be made between the end of the second semester and the end of the fourth semester. In exceptional circumstances, a student who has completed an honours Computer Science degree (or an equivalent 4-year Computer Science 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. Contact the SOCS for additional information.

**Transfer From Another PhD Program**

A student who wishes to transfer from another closely related PhD program at the University of Guelph into the PhD program should submit:

- a program transfer application form;
- original transcripts from all past programs; and
- a written description of the progress in the previous program including copies of qualifying examination documents or thesis proposal where available.

**Part-Time Study**

Students may not enter the PhD program as part-time. A full-time PhD student may apply for part-time studies only after the minimum duration for the degree has been completed. The application will not be granted unless the candidate has completed the qualifying exam and the thesis research is well established.

**Degree Requirements**

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

- Completion of the minimum specified duration of the program.
- Completion of the Technical Communication and Research Methodology course CIS*6890 (unless the student has taken an equivalent course in the MSc program) and at least four other graduate courses with an overall average of at least 70%.
- Students who are admitted without an appropriate MSc are required to take the Technical Communication and Research Methodology course CIS*6890 and at least eight other graduate courses with an overall average of at least 70%.
- Satisfaction of the breadth requirement.
- Completion of the seminar requirement.
- A successfully completed Qualifying Examination.
- An accepted thesis and the successful completion of a final oral examination.

**Duration of the Program**

At least 5 semesters of full-time study must be completed in the doctoral program following completion of a recognized master's degree in Computer Science or a related discipline. At least 7 semesters are required for those who are permitted to proceed from the honours baccalaureate without completing a master's degree. The actual length of the program depends on the academic preparation of the student and the choice of research topic. A typical PhD student (after an MSc) is expected to complete the program in 12 semesters.

**Course Requirement**

A PhD student, following the completion of a recognized master's degree in Computer Science or related discipline, is required to take the Technical Communication and Research Methodology course CIS*6890 (unless the student has taken an equivalent course in the Masters program) and at least four other CIS graduate courses with an overall average of at least 70%. With approval from the Graduate Committee, a CIS graduate course requirement may also be met by a non-CIS graduate course. At most one may be a reading course CIS*6660.

A PhD student admitted without an appropriate Masters is required to take the Technical Communication and Research Methodology course CIS*6890 and at least eight CIS graduate courses with an overall average of at least 70%. With approval from the Graduate Committee, a CIS graduate course requirement may also be met by a non-CIS graduate course. At most two reading courses CIS*6660 and at most one 4000-level course can count towards the course requirement.

May 13, 2014
Breadth Requirement
For breadth requirement purposes, the subject matter of computer science is divided into three broad categories, and each category is subdivided into two to three areas:

Systems (category S)
- Software Engineering (area S1)
- Programming Languages (area S2)
- Computer Architecture and System Software (area S3)

Mathematics of Computation (category M)
- Algorithms and Complexity (area M1)
- Scientific and Symbolic Computing (area M2)

Applications (category A)
- Artificial Intelligence (area A1)
- Databases (area A2)
- Graphics, Imaging and User Interfaces (area A3)

Each SOCS graduate course falls into one of the eight areas. A student must have sufficient background in five of these areas, including at least one from each category.

A student has gained sufficient background in an area if the student:
- has taken a CIS graduate course in the area**, or
- has taken a non-CIS equivalent course in the area** (approval required from Graduate Committee), or
- has extensive industrial experience in the area (approval required from Graduate Committee), or
- has written a Master thesis in the area (approval required from Graduate Committee).

**Each course must have a grade of at least 70% and at most one reading course may be counted towards fulfilling the breadth requirements.

A student must satisfy the breadth requirement no later than the fourth semester after entering the program, otherwise the student may be required to withdraw from the program. The student, therefore, should develop a plan of study no later than the end of the second semester, and seek approval from the Graduate Coordinator.

Seminar Requirement
A PhD student must give two publicly announced research seminars on his/her PhD thesis research.

The first seminar is intended to be an exploratory look at the student’s research area. It may include a Literary Review and a Survey of the area. The following apply:
- Must be presented prior to the Qualifying Examination.
- The student will be allocated times and dates for the seminars.
- 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 second seminar is intended for students to present their preliminary results to get feedback on analysis presentation and progress towards defense. The following apply:
- Must be presented prior to the thesis defense.
- The student will be allocated times and dates for the seminars in consultation with the Advisory Committee.
- Students will provide a title and extended abstract to the Graduate Secretary at least two weeks before seminar.
- Must be attended by at least two members of the student’s Advisory Committee and two SOCS regular graduate faculty members.
- Must be one hour in length. The student must speak for a minimum of thirty minutes and no more than forty-five minutes.
- The quality of the presentation is graded on a pass/fail basis. The student must receive three or more pass votes to pass. Two pass votes and two fail votes will mean the student must attempt the seminar again.

Qualifying Examination
The student must satisfy the breadth requirement before the Qualifying Examination (QE). The QE must be completed no later than the final semester of the minimum duration for the degree (either 5 or 7 semesters). The focus of the examination is to assess the candidate's ability and promise in the selected research area.

Arrangements for the QE should be made at least 4 weeks prior to the anticipated date of the QE oral presentation, and the student must submit a research proposal to the Examination Committee at least 2 weeks prior to the QE. The research proposal should contain, as a minimum, the following items:
- A survey of appropriate background literature.
- A description of the proposed research.
- A statement describing the merits and scholarly value of the proposed research.
- A schedule of the research program that the candidate will follow, including a sequence of milestones and objectives.

The examination consists of an oral presentation by the student followed by questions from the Examination Committee.

Thesis Defence
Arrangements for the PhD thesis defence should be made 8 weeks prior to the anticipated date of the defence, and the student must submit his/her PhD thesis to the Examination Committee at least 4 weeks prior to the defence. The examination consists of an oral presentation by the student followed by questions from the Examination Committee.

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

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>CIS*6000</td>
<td>Distributed Systems U [0.50]</td>
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<tr>
<td>CIS*6020</td>
<td>Artificial Intelligence U [0.50]</td>
<td></td>
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<tr>
<td>CIS*6030</td>
<td>Information Systems U [0.50]</td>
<td></td>
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<tr>
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<td>Discrete Optimization U [0.50]</td>
<td></td>
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<tr>
<td>CIS*6320</td>
<td>Image Processing Algorithms and Applications U [0.50]</td>
<td></td>
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<tr>
<td>CIS*6420</td>
<td>Soft Computing U [0.50]</td>
<td></td>
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<tr>
<td>CIS*6890</td>
<td>Technical Communication and Research Methodology U [0.50]</td>
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<tr>
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<td>Neural Networks U [0.50]</td>
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<tr>
<td>CIS*6060</td>
<td>Bioinformatics U [0.50]</td>
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<tr>
<td>CIS*6080</td>
<td>Genetic Algorithms U [0.50]</td>
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<tr>
<td>CIS*6090</td>
<td>Hardware/Software Co-design of Embedded Systems U [0.50]</td>
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<tr>
<td>CIS*6100</td>
<td>Parallel Processing Architectures U [0.50]</td>
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</table>

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

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2012-2013 Graduate Calendar
May 13, 2014
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</tr>
</thead>
<tbody>
<tr>
<td>CIS*6120</td>
<td>Uncertainty Reasoning in Knowledge Representation U</td>
<td>0.50</td>
<td>Representation of uncertainty, Dempster-Schafer theory, fuzzy logic, Bayesian belief networks, decision networks, dynamic networks, probabilistic models, utility theory.</td>
</tr>
<tr>
<td>CIS*6130</td>
<td>Object-Oriented Modeling, Design and Programming U</td>
<td>0.50</td>
<td>Objects, modeling, program design, object-oriented methodology, UML, CORBA, database</td>
</tr>
<tr>
<td>CIS*6140</td>
<td>Software Engineering U</td>
<td>0.50</td>
<td>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.</td>
</tr>
<tr>
<td>CIS*6160</td>
<td>Multiagent Systems U</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>CIS*6200</td>
<td>Design Automation in Digital Systems U</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>
</tr>
<tr>
<td>CIS*6490</td>
<td>Analysis and Design of Computer Algorithms U</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>
</tr>
<tr>
<td>CIS*6650</td>
<td>Topics in Computer Science I U</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>
</tr>
<tr>
<td>CIS*6660</td>
<td>Topics in Computer Science II U</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>
</tbody>
</table>

**Restriction(s):** Requires instructor's signature.
Creative Writing

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

Administrative Staff

Director of SETS
Dr. Alan Filewod (425 MacKinnon, Ext. 53881)
filewod@uoguelph.ca

Graduate Coordinator
Ajay Heble (427 MacKinnon, Ext. 53445)
aheble@uoguelph.ca

Graduate Secretary
Olga Petrik (427 MacKinnon, Ext. 56315)
petrik@uoguelph.ca

Associate Coordinator, MFA Creative Writing Program
Catherine Bush (Guelph-Humber Campus, (416) 798-1331, Ext. 6244)
cbush@uoguelph.ca

Assistant to the Associate Coordinator, MFA Creative Writing Program
Meaghan Strimas (Guelph-Humber Campus, (416) 798-1331, Ext. 6244)
mstrimas@uoguelph.ca

Graduate Faculty

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

Judith Thompson
BA Queen’s, Cert. National Theatre School - Professor

MFA Program

Admission Requirements

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

Admissions Portfolio

Applicants will be selected for admission to the MFA Program primarily on the basis of a portfolio and a letter of no more than three pages describing the applicant’s aspirations as a writer and an indication of the genres in which he/she is most interested. The portfolio should contain up to 25 and 40 pages in length, double-spaced, and may contain published and/or unpublished work, and/or work-in-progress. It must include a minimum of three separate works (or excerpts from separate works). Applicants are strongly 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 demonstrate special strength, will have some impact on admission decisions.

Degree Requirements

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

Plenary Courses

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

Workshops

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

Individual Study Course

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

Thesis

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

Courses

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

CRWR*6000 Plenary Course: Writers on Writing F [0.50]

This required plenary course addresses important historical and contemporary perspectives on creative writing as an art, a practice, and a profession. Readings, discussion and visits from writers and other literary professionals will help students to articulate effectively their own literary aesthetic and to develop professional skills.

CRWR*6010 Plenary Course: Writers in the World 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 positions and to develop professional skills.

CRWR*6100 Poetry Workshop F-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.

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.

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.

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.
<table>
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<tr>
<th>Course Code</th>
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<th>Description</th>
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</thead>
</table>
| 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 |
| 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. |
## Core Courses

**CCJP*6100** Governing Criminal Justice F [0.50]
This course analyzes criminal justice policy and governance of the criminal justice system from applied and theoretical perspectives. Particular attention is paid to the interplay between criminal justice policy and management and the larger political process.

*Restriction(s):* CCJP students

**CCJP*6300** Research Methods in Criminal Justice F [0.50]
This course introduces students to the primary methods, data sources and statistical methods used in criminal justice and criminology research. Particular attention will be paid to the role research methods and statistics play in shaping criminal justice/criminological theory, research and policy.

*Restriction(s):* CCJP students or instructor's signature

## Elective Courses

**CCJP*6000** Courts W [0.50]
This course examines courts from a variety of political, social, and socio-legal perspectives depending on the interest of the instructor(s). Particular attention will be paid to the role of courts in shaping criminal justice policy through such means as constitutional decisions and sentencing decisions.

*Restriction(s):* CCJP students. Instructor's signature required if not in the CCJP program

### Elective Courses

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<tr>
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<tbody>
<tr>
<td>SOC*6070</td>
<td>0.50</td>
<td>Sociological Theory</td>
</tr>
<tr>
<td>SOC*6130</td>
<td>0.50</td>
<td>Quantitative Research Methods</td>
</tr>
<tr>
<td>SOC*6140</td>
<td>0.50</td>
<td>Qualitative Research Methods</td>
</tr>
<tr>
<td>SOC*6270</td>
<td>0.50</td>
<td>Diversity and Social Equality</td>
</tr>
<tr>
<td>POLS*6400</td>
<td>0.50</td>
<td>Comparative Social Policy</td>
</tr>
<tr>
<td>POLS*6630</td>
<td>0.50</td>
<td>Approaches to Public Policy</td>
</tr>
<tr>
<td>POLS*6640</td>
<td>0.50</td>
<td>Canadian Public Administration: Public Sector Management</td>
</tr>
<tr>
<td>POLS*6950</td>
<td>0.50</td>
<td>Specialized Topics in Political Studies</td>
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<tr>
<td>SOC*6600</td>
<td>0.50</td>
<td>Reading Course</td>
</tr>
</tbody>
</table>

## 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

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Credits</th>
<th>Description</th>
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</table>
**Economics**

The Department of Economics and Finance www.economics.uoguelph.ca offers programs of study leading to the MA and PhD degrees. Students may also register in this Department to take programs in collaborative International Development Studies (IDS).

**Administrative Staff**

**Chair**
John Livernois (725 MacKinnon, Ext. 56339)
live@uoguelph.ca

**Graduate Co-ordinator**
Thanasis Stengos (715 MacKinnon, Ext. 53917)
tstengos@uoguelph.ca

**Graduate Program Assistant**
Sandra Brown (727 MacKinnon, Ext. 56341)
sandilyn@uoguelph.ca

**Graduate Faculty**

<table>
<thead>
<tr>
<th>Name</th>
<th>Degree and University</th>
</tr>
</thead>
<tbody>
<tr>
<td>J. Atsu Amegashie</td>
<td>BA Ghana, MA Queen's, MA Dalhousie, PhD Simon Fraser - Associate Professor</td>
</tr>
<tr>
<td>Kurt Annen</td>
<td>MA, PhD Fribourg (Switzerland) - Associate Professor</td>
</tr>
<tr>
<td>C. Bram Cadby</td>
<td>BSc London School of Economics, MA Queen's, PhD MIT - Professor</td>
</tr>
<tr>
<td>Laurent Cellarier</td>
<td>BA, MA Limage (France); PhD Southern California - Associate Professor</td>
</tr>
<tr>
<td>Brian S. Ferguson</td>
<td>BA Mount Allison, MA Guelph, PhD Australian National - Professor</td>
</tr>
<tr>
<td>Talat Gene</td>
<td>BS, MA Bogazici, MA, Ms, PhD Arizona - Associate Professor</td>
</tr>
<tr>
<td>Johanna Goertz</td>
<td>BSc Bonn, MA, PhD Ohio State - Assistant Professor</td>
</tr>
<tr>
<td>Louise A. Grogan</td>
<td>BSc London School of Economics, MA Catholique de Louvain, PhD Amsterdam - Associate Professor</td>
</tr>
<tr>
<td>Michael J. Hoy</td>
<td>BMath Waterloo, PhD London School of Economics - Professor</td>
</tr>
<tr>
<td>Kris E. Inwood</td>
<td>BA Trent, MA, PhD Toronto - Professor</td>
</tr>
<tr>
<td>Rene Kirkegaard</td>
<td>BA, MSc, PhD Aarhus - Associate Professor</td>
</tr>
<tr>
<td>Stephen Kosemepel</td>
<td>BA Queen's, MA Victoria, PhD Simon Fraser - Associate Professor</td>
</tr>
<tr>
<td>Mei Li</td>
<td>BA, MA Wuhan, MA, PhD Queen's - Assistant Professor</td>
</tr>
<tr>
<td>John R. Livernois</td>
<td>BA Toronto, MA, PhD British Columbia - Professor and Chair</td>
</tr>
<tr>
<td>Patrick Martin</td>
<td>BA California (Irvin), MA Cornell, PhD Guelph - Assistant Professor</td>
</tr>
<tr>
<td>Alex Maynard</td>
<td>BA Cornell, MA, MPhil, PhD Yale - Associate Professor</td>
</tr>
<tr>
<td>Chris J. McKenna</td>
<td>BSc Salford, DPhil York - Professor</td>
</tr>
<tr>
<td>Ross McKittrick</td>
<td>BA Queen's, MA, PhD British Columbia - Professor</td>
</tr>
<tr>
<td>Miana Plesca</td>
<td>BSc Technical University of Cluj (Romania); MA Georgetown (Washington, D.C.); PhD Western Ontario - Assistant Professor</td>
</tr>
<tr>
<td>David M. Prescott</td>
<td>BA Durham, MA Warwick, PhD Queen's - Professor</td>
</tr>
<tr>
<td>Asha Sadanand</td>
<td>BSc, MA Alberta, PhD California Institute of Technology - Professor</td>
</tr>
<tr>
<td>Thanasis Stengos</td>
<td>BSc, MSc London School of Economics, PhD Queen's - Professor and Graduate Co-ordinator</td>
</tr>
<tr>
<td>Yiguo Sun</td>
<td>BSc Hebei Normal, MSc Hebei Teacher's, MA Guelph, PhD Toronto - Associate Professor</td>
</tr>
<tr>
<td>Francis Tapon</td>
<td>DES Paris, MBA Columbia, MA, PhD Duke - Professor</td>
</tr>
<tr>
<td>Henry Thille</td>
<td>BComm Saskatchewan, MA, PhD British Columbia - Associate Professor</td>
</tr>
<tr>
<td>Illias Tsiakas</td>
<td>BA Toronto, MA York, PhD Toronto - Associate Professor</td>
</tr>
</tbody>
</table>

**Degree Requirements**

**MA Program**

The MA program contains core courses in theory and quantitative methods. Fields are offered in most areas of economics.

**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+’ (upper-second class) average as a minimum.

Students whose background is not in economics but who are otherwise outstanding should consult the Department website for further information. Applicants whose background in economics is difficult to evaluate may be granted admission as a provisional graduate student for one semester. If, at the end of the semester, the Department is satisfied with the student’s progress, it will recommend to the Assistant VP of Graduate Studies that the student be transferred to regular graduate student status.

Program offices should be consulted for admission deadlines.

**Degree Requirements**

The MA program requires completion of 4 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 main routes to the MA in Economics: by course work and project, and by course work and thesis. Most candidates pursue the first route.

**MA Core**

Usually it takes three semesters to complete the requirements for the MA though it is possible to intensify the program and complete it in two semesters.

The program of study includes three core courses (ECON*6000, ECON*6020 and, at the discretion of the graduate committee, ECON*6180 or ECON*6140).

The alternative econometrics sequences are designed to benefit students with different undergraduate backgrounds. Students with a satisfactory record of undergraduate work in econometrics will be required to take ECON*6140, while those with less undergraduate preparation will be required to take ECON*6180. The course ECON*6605 is offered primarily to students outside the Department but is available to incoming MA students as an extra course in preparation for ECON*6180.

**MA Options**

In addition to the core (1.5 credits), students may take one of the following two options. The vast majority of students choose option 1.

1. 1.5 graduate course credits and the Research Project - ECON*6940 (1.0 credit)
2. 0.5 graduate course credits and a Thesis.

**PhD Program**

The objective of the PhD program is to train individuals who already have a strong background in economics to become independent and skilled researchers, in preparation for a career in academia, government or the private sector. Course offerings cover a broad range of topics in theoretical and applied economics. PhD candidates may write a dissertation in any of the areas of expertise of the graduate faculty in the Department. In addition, the Department participates in a collaborative PhD program in International Development Studies.

Graduates are expected to have demonstrated competence at an advanced level in the core areas of Microeconomic theory, Macroeconomic theory, and Econometrics, to have demonstrated competence at the cutting edge of knowledge in their area of specialization and advanced competence in at least one other area, and to have demonstrated mature scholarship, research and communication abilities.

**Admission Requirements**

Applicants to the PhD program should have a master's degree in economics with a minimum average of 80% (A-) in their postgraduate studies. Applicants without a master's degree but with an outstanding record at the baccalaureate level, may be admitted initially to the MA program in economics. For students who achieve a superior record and show an aptitude for research, The Board of Graduate Studies, on the recommendation of the Department, may authorize transfer to the PhD program without requiring the student to complete a master's degree.

**Degree Requirements**

The program requires the satisfactory completion of a minimum of 12 courses covering core theory, econometrics, and field courses. (Students with an MA will be given credit for courses already in hand, where appropriate). The following sequence of milestones represents the typical path through the PhD program.
Year I: Core Courses

Students must complete the following courses, in preparation for the comprehensive examinations in economic theory, which is written at the end of Year I:

**Econometrics**
- ECON*6140 [0.50] Econometrics I
- ECON*6160 [0.50] Econometrics II

**Theory**
- ECON*6000 [0.50] Microeconomic Theory I
- ECON*6010 [0.50] Microeconomic Theory II
- ECON*6020 [0.50] Macroeconomic Theory I
- ECON*6040 [0.50] Macroeconomic Theory II

**Year II: Dissertation Proposal**

After the theory comprehensive exams are passed, students must prepare a PhD proposal under the supervision of a faculty member. Proposals are presented to the Department at a symposium, and upon acceptance the Graduate Coordinator will notify the Assistant VP of Graduate Studies that the student has passed the "Qualifying Examination" requirement as set out by the Faculty of Graduate Studies. At this point, the student becomes a "candidate" for the PhD.

Year III and IV: Thesis

Submission and defence of an acceptable thesis on a topic approved by the student's advisory committee completes the requirements for the PhD. The thesis is expected to be a significant and original contribution to knowledge in its field and must demonstrate scholarship and critical judgement on the part of the candidate. Theses must be submitted within 48 months of completing the minimum duration.

**Business Studies MBA Program**

The Department of Economics and Finance participates in the MBA program in the fields of agribusiness management which is offered by the Department of Food, Agricultural and Resource Economics.

**Collaborative Programs**

**International Development Studies MA**

The Department of Economics and Finance participates in the collaborative International Development Studies (IDS) program. Applicants for this program enter through one of the participating departments; course selections are based, in part, on the applicant's primary discipline. Those faculty members in the Department of Economics and Finance, whose research and teaching expertise includes aspects of international development studies may serve as advisors for these MA students. Please consult the International Development Studies listing for a detailed description of the MA collaborative program including the special additional requirements for each of the participating departments.

**Courses**

**Economic Theory**
- **ECON*6000 Microeconomic Theory I U [0.50]**
  A first graduate course in microeconomics, presenting a rigorous treatment of consumer theory, producer theory, applications of duality, partial equilibrium, general equilibrium and the fundamental theorems of welfare economics.

- **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

- **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.

- **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

- **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.

- **ECON*6090 Game Theory U [0.50]**
  This course introduces the student to game theory, which is an important tool for modelling economic situations with multi-person interaction. Economic applications such as oligopoly, bargaining, auctions, and public goods provision will be discussed. Broader applications to voting games, candidate strategy, war games, and parlour games will also be briefly discussed. Students need to be very familiar with optimization and single person decision-making.

- **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.

- **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.

**Econometrics**
- **ECON*6050 Introduction to Econometric Methods U [0.50]**
  Introduction to the specification, estimation and testing of econometric 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.

- **ECON*6140 Econometrics I U [0.50]**
  Topics include a review of the classical linear regression model, applications of generalized least squares, maximum likelihood methods and various statistical test procedures.

- **ECON*6160 Econometrics II U [0.50]**
  Topics include maximum likelihood as a method of estimation and inference, nonlinear estimation and simultaneous equations. Also more specialized topics such as limited-dependent-variable models and non-parametric regression methods may be covered.

- **ECON*6170 Topics in Econometrics U [0.50]**
  This is an advanced econometrics topics course that covers the area of non-parametric and semiparametric estimation and testing of econometrics models, including time series and panel data semiparametric models.

- **ECON*6180 Econometric Methods U [0.50]**
  This course follows ECON*6050. It covers estimation by instrumental variables, estimations of simultaneous systems, asymptotic distribution theory, maximum likelihood estimation, binary choice and limited dependent variables models, and issues in time series analysis.

**Economic History**
- **ECON*6200 Economic History U [0.50]**
  This course considers topics in economic history which vary from year to year. The emphasis will be usually on late-19th or 20th century topics and often involves a world emphasis. Student presentations and papers form a large part of the course.

- **ECON*6370 Economic Development in Historical Perspective U [0.50]**
  This course will examine the experience of economic development focusing on the emergence of the Third World. Topics for discussion will vary from year to year; they may include the impact of trade expansion during the eighteenth and nineteenth centuries, the role of manufacturing as a leading sector, statist vs. the new classical approaches to government policy, and others.

**Money and Finance**
- **ECON*6320 International Finance U [0.50]**
  This course deals with the theoretical policy and issues of international finance. Topics may include exchange rate determination, capital flows in international markets, the financing of trade flows, and open economy macroeconomic models and policy issues.

- **ECON*6380 Financial Economics U [0.50]**
  This course has three objectives: (i) build a common background for all students in asset pricing and corporate finance in order to facilitate discussion of finance research; (ii) provide an in-depth look at selected finance topics, and (iii) expose students to top published research papers.
**ECON*6390 Empirical Finance and Financial Econometrics U [0.50]**  
This course covers topics in empirical finance, involving the integration of financial theory, financial econometrics, and data analysis. Students will learn how empirical research in finance is conducted through reading involving both textbooks and journal articles and from conducting an independent research project.  
Co-requisite(s): ECON*6140

**ECON*6490 Money and Banking U [0.50]**  
This course studies monetary economies using overlapping generations models, MIU models and CIA models. More specifically, we will study major issues in money and banking, such as the role of money and banks, the cost of inflation, and the optimal monetary policies.

**Developmental Economics**

**ECON*6350 Economic Development U [0.50]**  
This course examines economic development from an international perspective: theories, history, policies and prospects.

**Labour Economics**

**ECON*6600 Labour Economics U [0.50]**  
Major themes in labour market theory including static and dynamic labour demand and supply, migration and wage structures and dynamics, unemployment, migration and the role of social programs.

**ECON*6610 Topics in Labour Economics U [0.50]**  
This course complements ECON*6600. Topics include advanced issues in family labour supply, human capital, wage bargaining and contract theory, search theory, duration analysis and its application to major labour market spells such as employment and unemployment.

**Environmental and Resource Economics**

**ECON*6800 Environmental Economics U [0.50]**  
A topics course concerning the interrelationships between economic activities and the state of the natural environment. Topics may include: pollution and economic growth; energy use and environmental quality; international trade and pollution; policies for controlling pollution; techniques for assessing the benefits of environmental improvement.

**ECON*6810 Economic Theory of Natural Resources Use U [0.50]**  
This course examines economic models of the use of non-renewable resources to analyze issues such as resource conservation, sustainable development, taxation of resource rents, and price determination in resource markets.

**Other**

**ECON*6300 International Trade Theory U [0.50]**  
This course provides a rigorous treatment of both positive and normative aspects of trade theory through extensive use of general equilibrium models under varying assumptions. Topics may also include barriers to trade, international factor movements, growth and development, and strategic trade policy.

**ECON*6400 Public Finance U [0.50]**  
This course surveys the normative theory of the public sector. Topics may include public expenditure theory, tax theory, cost benefit analysis and fiscal federalism.

**ECON*6650 Economics of Social Welfare U [0.50]**  
This course deals with the analysis of social welfare programs, concentrating on national health insurance. It covers their structure, incentives and distribution effects, and includes empirical analysis of existing programs.

**ECON*6700 Industrial and Market Organization U [0.50]**  
The major topics of industrial organization are analyzed from both a game theoretic perspective and from a Structure-Conduct-Performance perspective. Typical topics include: oligopoly theory, determinants of industrial structure, Coase theorem, market entry, advertising, research and development, product differentiation, and price discrimination.

**ECON*6750 Managerial Economics U [0.50]**  
The course introduces students to the latest developments in the economic analysis of the inside workings and organization of firms. The course tries to explain the diversity of economic organizations, and more generally why economic activity is sometimes carried out through firms and sometimes through markets. For graduate students outside the Department of Economics and Finance.

**ECON*6770 Financial Management U [0.50]**  
This course examines the implications of financing decisions made by firms in a world of uncertainty. Topics such as capital budgeting, capital structure, dividend policy, market efficiency and capital asset pricing will be analyzed from the perspective of corporate finance and portfolio management theory. Co-requisite: AGEC*6070. For graduate students outside the Department of Economics and Finance.

**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.

**ECON*6940 Research Project U [1.00]**  
All students who choose the research project option in the MA program will register in this course. Research projects are written under the direct supervision of a faculty member. Normally, research projects are completed within one or two semesters. Students must make a presentation of their work and a copy of the final report must be submitted to the Department before the final grade is submitted to the Office of Graduate Studies.
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 four fields of study: Biological Engineering, Environmental Engineering, Engineering Systems and Computing and 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. Recent 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 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.

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.

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.

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. The MEng program is intended to provide advanced training in engineering sciences, analysis, design, and research methodology. This objective is achieved through a combination of course work, applied research, and thesis writing. Upon graduation students will be able to analyse and research an engineering problem and apply their acquired skills and knowledge in a practical solution. A final examination is conducted following a public seminar presentation of the student's thesis.

The PhD program prepares candidates for a career in engineering teaching, research, or consulting. The program is designed to provide both broad knowledge of engineering science and training in advanced research. Doctoral research carries the expectation of making an original contribution to the body of existing knowledge or technology. It is also expected that the responsibility of problem definition and solution is that of the student, and that the student's advisor acts truly in an advisory capacity. Therefore, graduates are expected to have acquired autonomy in defining and analysing problems, conducting research, and preparing scholarly publications. These objectives are achieved through a combination of course work, independent research, a qualifying examination, and the production and defence of a research dissertation.

### Administrative Staff

**Director**

Hussein A. Abdullah (Thornbrough, Ext. 52430)  
soedir@uoguelph.ca

**Associate Director, Undergraduate Studies**

Bill Van Heyst (Thornbrough, Ext. 53665)  
bvanheys@uoguelph.ca

**Associate Director, Graduate Studies**

Doug Joy (Thornbrough, Ext. 53048)  
djoy@uoguelph.ca

**Graduate Secretary**

Laurie Gallinger (Thornbrough, Ext. 56187)  
sograd@uoguelph.ca

### Graduate Faculty

**Hussein A. Abdullah**  
BSc University of Technology, MSc, PhD Glasgow, PEng - Professor and Director

**Shawki Areibi**  
BSc-Al-Fateh, MASc Waterloo, PhD Waterloo, PEng - Associate Professor

**Mohammad Biglari-Baghdig**  
BSc Tehran, MA Toronto, PhD Waterloo - Assistant Professor

**Andrea L. Bradford**  
BSc, PhD Queen's, PEng - Associate Professor

**Sheng Chang**  
BEng Chengdu Univ., PhD New South Wales - Associate Professor

**Fantahun Defersah**  
BSc Ethiopia, MEng India, PhD Concordia - Assistant Professor

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

**Brajesh Dubey**  
BTech, Indian Inst. of Technology, PhD Florida - Assistant Professor

**Animesh Dutta**  
BSc Bangladesh, MEng Thailand, PhD Dalhousie - Assistant Professor

**Khosrow Farahbahksh**  
PhD Alberta, PEng - Associate Professor

**Dalia Fayek**  
PhD Waterloo, PEng - Associate Professor

**Brahram Gharabaghi**  
BSc Iran Univ. of Science and Technology, MSc Shariat Univ. of Science and Technology, PhD Guelph, PEng - Associate Professor

**Karen D. Gordon**  
BSc Guelph, PhD Western Ontario - Associate Professor

**Stefano Gregori**  
Laurea, Doctorate Pavia - Associate Professor

**Kevin Hall**  
BSc, MSc Queen's, PhD New South Wales, PEng - Professor and Vice-President Research

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

**Douglas M. Joy**  
BASc Toronto, MASc Ottawa, PhD Waterloo, PEng - Professor and Associate Director, Graduate Studies

**Wm. David Lubitz**  
BSc, MSc California, PEng - Assistant Professor

**Shoheel Mahomud**  
BSc, MSc Bangladesh Univ. of Engineering and Technology, PhD Waterloo - Assistant Professor

**Hassan Marwan**  
BSc, Helwan Univ., MSc Tuskegee Univ., PhD McMaster - Associate Professor

**Edward McBea**  
PhD Massachusetts Institute of Technology, PEng - Professor and Assistant Dean, External Partnerships, College of Physical and Engineering Science

**Manjusri Misra**  
BSc, MSc, MPphil, PhD Utalk - Associate Professor

**Medhat A. Moussa**  
BSc American, MASc Moncton, PhD Waterloo, PEng - Associate Professor

**Radu Muresan**  
Dipl. Eng Technical Univ. of Cluj-Napoca (Romania); MASc, PhD Waterloo, PEng - Associate Professor

**Suresh Neethirajan**  
B.A.Eng Tamil Nadu, MA and PhD Manitoba - Assistant Professor

**Michele L. Oliver**  
BPE McMaster, MPE, MSc, PhD New Brunswick, PEng - Professor
IX. Graduate Programs, Engineering

Baccalaureate degree in engineering or equivalent. Applicant must be a graduate from
Food Process Engineering Design
Bioreactor Design
Systems and Control Theory
Bachelor of Science degree or equivalent. At least a second class honours standing
Bioinstrumentation Design
Engineering Unit Operations
Water and Wastewater Treatment
Introduction to Environmental Engineering
Hydrology
Solid Waste Management
Electric Circuits
Heat and Mass Transfer
Air Quality
Biological/Food/Bioprocess Engineering
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

 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
studies committee. Students deficient in certain areas will be required to take make-up
undergraduate courses. Such students will be admitted and allowed to continue on
provisional status for a maximum of two semesters or until the requirements are completed.
These courses will not count toward the student's graduate credit requirements.

Degree Requirements

MASc by Thesis
The prescribed program of study must consist of no fewer than 2.0 credits, of which at
least 1.5 credits must be at the graduate level, and at least 1.0 must be engineering graduate
courses. Under special circumstances the school may reduce the 1.5 credit course
requirement; however, the two graduate-engineering-course requirement will not be
changed. In all cases the remaining courses must be acceptable for graduate credit; that
is, they must be either graduate courses or senior undergraduate courses. Depending on
the student's background, the advisory committee may specify more than four courses,
including undergraduate make-up courses. If make-up courses are deemed necessary, they
will be considered additional courses.

MEng Degree
The prescribed program of studies consists of at least 5.0 credits acceptable for graduate
credit. This includes 2.5 credits from the program core (see the School of Engineering
Graduate Handbook), and 2.5 additional credits chosen from approved courses (section
5.5 of the School of Engineering Graduate Handbook). No more than 1.0 of these credits
will be for undergraduate engineering courses, as approved by the Director, and no more
than 1.5 credits will be from courses offered outside the School of Engineering. For the
final project course (1.0 credit), one member of the graduate faculty will be appointed by
the Associate Director, Graduate Studies as an advisor.

PhD Program

Admission Requirements
The minimum academic requirement for admission to the PhD program is normally a
recognized Master's degree in engineering. Applicants are usually required to have
completed a Bachelor’s and a Master’s degree from a recognized post-secondary institution
and must have achieved a minimum B average in their Master’s program. Applicants must
also have demonstrated strong potential for research. A strong recommendation from the
MASc advisor is necessary. Direct admission to the PhD program from a Bachelor's
program is rarely granted. Applicants requesting direct admission must hold a bachelor's
degree with exceptionally high academic standing and have related research experience.
Such applicants should discuss this option with the Associate Director, Graduate Studies
at the earliest opportunity.

Degree Requirements
The prescribed program of study must consist of no fewer than 2.0 credits in addition to
those taken as part of the MASc degree. At least 1.5 of the credits must be at the graduate
level, and at least 1.0 must be engineering graduate courses. Under special circumstances
and with the approval of the Director, the school may reduce the requirement for 1.5 credit
course requirement; however the two graduate-engineering-course requirement will not
be changed. In all cases the remaining courses must be acceptable for graduate credit;
that is, they must be either graduate courses or senior undergraduate courses. Depending
on the student's background, the advisory committee may specify more than four courses,
including undergraduate make-up courses. If make-up courses are deemed necessary, they
will be considered additional courses.

The qualifying examination as outlined in the Graduate Calendar is held by the end of
the fourth semester but no later than the fifth semester after the student has completed the
required courses.

Diploma Program

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 Studies 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.

Diploma Requirements

The prescribed program consists of 2.0 credits acceptable at the graduate level.

Modelling Applications in Water Resource Engineering

The core courses consist of a total of 2.0 credits, 1.5 credits must come from the list below. One of these must be ENGG*6800.

ENGG*6800 [0.50] Deterministic Hydrological Modelling
ENGG*6740 [0.50] Ground Water Modelling
ENGG*6840 [0.50] Open Channel Hydraulics
ENGG*6880 [0.50] Soil Erosion and Fluvial Sedimentation
ENGG*6030 [0.50] Finite Difference Methods
ENGG*6050 [0.50] Finite Element Methods
ENGG*4510 [0.50] Risk Assessment and Management
ENGG*6060 [0.50] Engineering Systems Modelling and Simulation

In addition, the student must complete ENGG*6910. This is a 0.5 credit, 1 semester course. This special topics course will focus on one of the following areas:

Watershed Systems Design
Soil-Water Conservation Systems Design
Urban Water Systems Design

And include a project utilizing a GIS-based modeling approach.

Engineering Design of Sustainable Water Resource Systems

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

ENGG*6610 [0.50] Urban Stormwater Management
ENGG*6860 [0.50] Stream and Wetland Restoration Design
ENGG*6840 [0.50] Open Channel Hydraulics
ENGG*6140 [0.50] Optimization Techniques for Engineering
ENGG*4510 [0.50] Risk Assessment and Management
ENGG*6680 [0.50] Advanced Water and Wastewater Treatment
ENVS*6280 [0.50] Soil Physics
RPD*6310 [0.50] Environmental Impact Assessment
ENGG*4250 [0.50] Watershed Systems Design2
ENGG*4360 [0.50] Soil-Water Conservation Systems Design2
ENGG*4370 [0.50] Urban Water Systems Design2

In addition to the courses above, the course ENGG*6910 must be completed. This is a 0.5 credit, one semester course. For each of these an area of emphasis from one of the following three areas must be selected:

Watershed Systems Design
Soil-Water Conservation Systems Design
Urban Water Systems Design

For this special topics course the project must focus on sustainability of water resources within the area of emphasis selected.

Interdepartmental Programs

MSc Food Safety and Quality Assurance

The School of Engineering participates in the MSc program in food safety and quality assurance. Those faculty members whose research and teaching expertise includes aspects of food safety and quality assurance may serve as advisors for MSc students. Please consult the Food Safety and Quality Assurance listing for a detailed description of the MSc program.

Collaborative Programs

Masters and PhD International Development Studies

The School of Engineering participates in the collaborative International Development Studies (IDS) MEng, MASc and PhD programs. The collaborative International Development Studies program 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 program will add the designation “International Development Studies” to your degree. Applicants apply directly through the School of Engineering and must meet the University of Guelph and department program admission requirements. Students should consult the International Development Studies listing to confirm the IDS program degree requirements.

Courses

General

ENGG*6000 Advanced Heat and Mass Transfer U [0.50]


ENGG*6010 Assessment of Engineering Risk U [0.50]

The question of “how safe is safe enough?” has no simple answer. In response, this course develops the bases by which we can assess and manage risk in engineering. Course deals with fate and transport issues associated with risk, as relevant to engineering and how these aspects are employed in the making of decisions.

Prerequisite(s): STAT*2040 or STAT*2120

ENGG*6020 Advanced Fluid Mechanics U [0.50]


ENGG*6030 Finite Difference Methods U [0.50]

Numerical solution of partial differential equations of flow through porous media; flow of heat and vibrations; characterization of solution techniques and analysis of stability; convergence and compatibility criteria for various finite difference schemes.

ENGG*6050 Finite Element Methods U [0.50]


ENGG*6060 Engineering Systems Modelling and Simulation U [0.50]

A study of theoretical and experimental methods for characterizing the dynamic behaviour of engineering systems. Distributed and lumped parameter model development. Digital simulation of systems for design and control.

ENGG*6080 Engineering Seminar U [0.00]

The course objective is to train the student in preparing, delivering and evaluating technical presentations. Each student is required to: (a) attend and write critiques on a minimum of six technical seminars in the School of Engineering; and (b) conduct a seminar, presenting technical material to an audience consisting of faculty and graduate students in the school. This presentation will then be reviewed by the student and the instructor.

ENGG*6090 Special Topics in Engineering U [0.50]

A course of directed study involving selected readings and analyses in developing knowledge areas which are applicable to several of the engineering disciplines in the School of Engineering.

Biological Engineering

ENGG*6110 Food and Bio-Process Engineering U [0.50]

Kinetics of biological reactions, reactor dynamics and design. Food rheology and texture; water activity and the role of water in food processing; unit operations design-thermal processing; and drying, freezing and separation processes.

ENGG*6120 Fermentation Engineering U [0.50]

Modelling and design of fermenter systems. Topics include microbial growth kinetics, reactor design, heat and mass transfer. Instrumentation and unit operations for feed preparation and product recovery. Prerequisite: undergraduate course in each of microbiology, heat and mass transfer, and biochemistry or bioprocess engineering.

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.

ENGG*6150 Bio-Instrumentation U [0.50]


Restriction(s): ENGG*3450 or equivalent.
ENGG*6160 Advanced Food Engineering U [0.50]
Application of heat and mass transfer, fluid flow, food properties, and food-processing constraints in the design and selection of food process equipment. Development of process specifications for the control of the flow of heat and moisture and the associated microbial, nutritional and organoleptic change in foods. Food system dynamics and process development.

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.

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.

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.

ENGG*6290 Special Topics in Agricultural Engineering U [0.50]
A course of directed study involving selected readings and analyses in developing knowledge areas of agricultural 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's signature required.

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.

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.

ENGG*6620 Water Pollution Control Planning U [0.50]
Methods of developing area-wide pollution control plans and sustainable use plans in Ontario and elsewhere. Quantitative and non-quantitative information is examined in the context of planning, using continuous models such as HSP-F. Field trips.

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.

ENGG*6640 Environmental Contaminants: Control Mechanisms U [0.50]
Analysis of conventional and innovative technologies for toxic contaminants; technologies for contaminated municipal and industrial waste waters, including physical, chemical, and biological treatment processes for trace toxic contaminants in water and wastewater; control technologies for contaminated gas streams, including activated carbon absorption, biofiltration, bioscrubbing, wet scrubbing, thermal- oxidation methods, and process modifications to reduce emissions of toxic air contaminants; remediation techniques for contaminated soil, including external and in-situ physical, chemical and biological treatment methods; cross-media contaminant control issues; toxicity testing and evaluation; relevant regulatory programs.

ENGG*6650 Advanced Air Quality Modelling U [0.50]
Analysis of analytical and computational models used to predict the fate of airborne contaminants; role of air quality models for the solution of engineering-related problems; analysis of important boundary layer meteorology phenomena that influence the fate of air pollutants; conservation equations and mathematical solution techniques; model input requirements such as emissions inventories; Gaussian models; higher-order closure models; Eulerian photochemical grid models.

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 or consent of instructor.

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.

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.

ENGG*6690 Non-Point Source Pollution and Its Control U [0.50]
Introduction to issues of non-point source pollution. Modelling of non-point source pollution approaches for vadose zone, surface and subsurface drained water. Scale issues in non-point source modelling. Management issues in non-point source pollution modelling. Application of non-point source pollution models to a variety of situations. Application of non-point source modelling and management approaches for many types of receiving water.

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.

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 open only to students in the environmental MEng program.

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.

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.

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.

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

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.
Prerequisite(s): ENGG*3450 or equivalent.

ENGG*6520 VLSI Digital Systems Design U [0.50]
This course will introduce the principles of VLSI MOSFET digital design from a circuit and system perspective. Advanced topics include: power issues related to each level of design abstraction; voltage and frequency scaling; power to speed trade offs; ASIC digital design flow; Verilog integration, ASIC case studies.
Prerequisite(s): ENGG*3450 or equivalent.

ENGG*6530 Reconfigurable Computing U [0.50]
This course serves as a graduate introduction into reconfigurable computing systems. It introduces students to the analyses, synthesis and design of embedded systems and implementing them using Field Programmable Gate Arrays. Topics include: Programmable Logic devices, Hardware Description Languages, Computer Aided Design, Hardware Accelerators, Software Co-design techniques, Run Time Reconfiguration, High Level Synthesis.
Prerequisite(s): ENGG*2410 or equivalent.

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.

ENGG*6550 Intelligent Real-Time Systems U [0.50]
Soft real-time systems, hard real-time systems, embedded systems, time handling and synchronization, deadlines, preemption, interruption, real-time languages, real-time operating systems, system life-cycle, petri nets, task scheduling and allocation, fault-tolerance, resource management, real-time search techniques, dealing with uncertainty.

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.

ENGG*6570 Advanced Soft Computing U [0.50]
Neural dynamics and computation from a single neuron to a neural network architecture. Advanced neural networks and applications. Soft computing approaches to uncertainty representation, multi-agents and optimization.
Prerequisite(s): ENGG*4430 or equivalent.

ENGG*6580 Advanced Control Systems U [0.50]
This course will start with state space analysis of multi-input multi-output control systems. Then state space design will be presented. After that, non linear control systems and soft computing based intelligent control systems will be studied. Finally, hybrid control systems, H infinity control and uncertainty and robustness in control systems will be addressed.

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.

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.

Water Resources Engineering

ENGG*6740 Ground Water Modelling U [0.50]
Introduction to current groundwater issues, definition of terms, review of fundamental equations describing fluid and contaminant transport in saturated groundwater zones. Mathematical techniques (analytical, fe and fd) for the solution of the fundamental equations. Application of numerical groundwater models to a variety of situations. Case studies. Review of groundwater models used in industry.

ENGG*6800 Deterministic Hydrological Modelling U [0.50]
Deterministic hydrological models. Function of watershed models for hydraulic design, environmental assessment, operation of water control structures, flood warning, Calculation algorithms.

ENGG*6810 Stochastic Hydrological Modelling U [0.50]

ENGG*6820 Measurement of Water Quantity and Quality U [0.50]
This course covers techniques used to measure rates of movement and amounts of water occurring as precipitation, soil water, ground water and streamflow. Available measurements of water quality are surveyed. Calculation procedures involved in the use of indirect indicators of water quantity and quality individually and in combination are described.

ENGG*6830 Design of Pressurized Flow Systems U [0.50]
Boundary resistance. Steady State and transient flow in gravity and pumped systems. Pressure control systems.

ENGG*6840 Open Channel Hydraulics U [0.50]
Basic concepts, energy principle; momentum principle; flow resistance; non-uniform flow; channel controls and transitions; unsteady flow; flood routing.

ENGG*6850 Design of Water Management Systems U [0.50]

ENGG*6860 Stream and Wetland Restoration Design U [0.50]
Explores the multi-disciplinary principles of stream and wetland restoration and the tools and techniques for restoration design. Restoration design is approached from a water resources engineering perspective with emphasis on hydrological and hydraulic techniques. Numerous case studies are examined as a means to identify more successful design approaches.
Prerequisite(s): ENGG*3650 or equivalent.

ENGG*6880 Soil Erosion and Fluvial Sedimentation U [0.50]
Students will be able to (i) describe processes related to soil erosion by water, (ii) describe processes related to fluvial sedimentation, (iii) evaluate and prescribe structural and non-structural control methods, and (iv) run at least one soil erosion/fluvial sedimentation computer model if the course is satisfactorily completed.

ENGG*6900 Final Project in Water Resources Engineering U [1.00]
A project course in which an advanced design problem in the area of watershed engineering is established, a feasibility investigation performed and a final design presented.
Restriction(s): This course is open only to students in the water resources MEng program.

ENGG*6910 Special Topics in Water Resources Engineering U [0.50]
A course of directed study involving selected readings and analyses in developing knowledge areas of water resources engineering.
English

Administrative Staff

Director
Alan Filewod (425 MacKinnon, Ext. 53268)
afilewod@uoguelph.ca

Graduate Coordinator
Ajay Heble (427 MacKinnon, Ext. 53445)
aheble@uoguelph.ca

Graduate Secretary
Olga Petrik (427 MacKinnon, Ext. 56315)
petrik@uoguelph.ca

Graduate Faculty

Christine Bold
MA Edinburgh, PhD University College London - Professor

Dionne Brand
BA, MA Toronto - Professor and University Research Chair

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

Julie Cairnie
BA Brock, MA, PhD York - Associate Professor and Graduate Coordinator

Gregor Campbell
BA, MA, PhD Toronto - Assistant Professor

Elaine Chang
BA British Columbia; MA, PhD Stanford - Associate Professor

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

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

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

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

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

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

Smaro Kamboureli
BA Aristotelian, MA, PhD Manitoba - Professor and Canada Research Chair

Marianne Micros
BA Sweet Briar College, MA Bonaventure, PhD Western - Associate Professor

Martha Nandorfy
BA, MA Ottawa, PhD Toronto - Associate Professor

Daniel O’Quinn
BSc, MA Western, PhD York - Professor

Stephen Powell
BA Oberlin College, MA Indiana, PhD Toronto - Associate Professor

Pablo Ramirez
BA Yale, MFA Miami, MA, PhD Michigan - Associate Professor

Paul W. Salmon
BA Western, MA Toronto, PhD Western - Assistant Professor

Jennifer Schacker
BA McGill, MA, PhD Indiana - Associate Professor

Sandra Singer
BA Trent, MA Queen's, PhD Cambridge - Associate Professor

J.R. (Tim) Struthers
BA, MA, PhD Western Ontario - Associate Professor

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 four fields: Canadian Literature, Postcolonial and Colonial Studies, Early Modern Studies, and Literary Theory/Cultural 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 a high second-class standing (78% or higher) in the last two years of study. Students with degrees with excellent academic records in other disciplines will also be considered. Successful applicants will be admitted in the Fall Semester, the Program’s only entry point. Program offices should be consulted for admission deadlines. If the applicant's first degree was completed in a country where English is not the first language, English-language proficiency must be documented at the time of application.

Degree Requirements

- Course-Work Option: six courses (6 x 0.50 credit); plus ENGL*6803 Research Project.
- Thesis Option: four courses (4 x 0.50 credit); plus a thesis of 20,000 to 25,000 words (80-100 pages) (2.0 credit).

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 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.

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).

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.

ENGL*6209 Topics in Colonial, Postcolonial and Diasporic Literature U [0.50]

A course to be offered at least once every academic year. A comparative study of postcolonial literatures in English. Topics may include a focus on a single area, such as India, the Caribbean, Africa, Australia, or New Zealand or may focus on the comparative study of some of these literatures, considering the construction of Third World, diasporic, or settler-invader colonies, or writing and reading practices in colonial, neo-colonial, and postcolonial environments.

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.

ENGL*6421 Topics in Eighteenth Century and Romantic Literature U [0.50]

A reading of the literature of Britain during the 18th century. Topics may focus on a single author, a specific genre, or relationships between the literary and the cultural.

ENGL*6431 Topics in Nineteenth Century Literature U [0.50]

A study of the literature of Britain 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.

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.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Description</th>
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<tbody>
<tr>
<td>ENGL*6451</td>
<td>Topics in American Literature U [0.50]</td>
<td>Topics may include a focus on a single region, such as the American West, on a single time period, such as the Civil War, on a specific genre, such as the novels of frontier women, or other issues in American literary studies.</td>
</tr>
<tr>
<td>ENGL*6611</td>
<td>Topics in Women's Writing U [0.50]</td>
<td>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.</td>
</tr>
<tr>
<td>ENGL*6621</td>
<td>Topics in Children's Literature U [0.50]</td>
<td>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.</td>
</tr>
<tr>
<td>ENGL*6641</td>
<td>Topics in Scottish Literature U [0.50]</td>
<td>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.</td>
</tr>
<tr>
<td>ENGL*6691</td>
<td>Interdisciplinary Studies U [0.50]</td>
<td>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.</td>
</tr>
<tr>
<td>ENGL*6801</td>
<td>Reading Course I U [0.50]</td>
<td>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 committee.</td>
</tr>
<tr>
<td>ENGL*6802</td>
<td>Reading Course II U [0.50]</td>
<td>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 committee.</td>
</tr>
<tr>
<td>ENGL*6803</td>
<td>Research Project U [1.00]</td>
<td>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 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.</td>
</tr>
<tr>
<td>ENGL*6811</td>
<td>Special Topics in English U [0.50]</td>
<td>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.</td>
</tr>
</tbody>
</table>
Environmental Sciences

The School of Environmental Sciences offers programs 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.

Administrative Staff

Director, School of Environmental Sciences
Jonathan Newman (am: 1106 Bovey Bldg, pm: 264 Alexander Hall, Ext. 52147) jnewma01@uoguelph.ca

Associate Director, School of Environmental Sciences
Claudia Wagner-Riddle (106 Alexander Hall, Ext. 52787) cwagnerr@uoguelph.ca

Associate Director, Graduate Studies, School of Environmental Sciences
Paul Sibley (2103 Bovey Bldg., Ext. 52707) psibley@uoguelph.ca

Graduate Secretary
Marie Vickery (260 Alexander Hall, Ext. 53937) ses.gradsec@uoguelph.ca

Graduate Faculty

Madhur Anand
BSc, PhD Western Ontario - Associate Professor

Emmanuelle Arnaud
BA McMaster, MSc UBC, PhD McMaster - Assistant Professor

Michael A. Dixon
BSc, MSc Mount Allison, PhD Edinburgh - Professor

Kari Dunfield
BSc Calgary, MSc, PhD Saskatchewan - Associate Professor

Susan Glasauer
BSc, MSc California, PhD Munich - Assistant Professor

Paul H. Goodwin
BS Villanova, MSc Minnesota, PhD California (Davis) - Professor

Andrew M. Gordon
BScF New Brunswick, PhD Alaska - Professor

Robert Gordon
BSc Guelph, MSc McGill, PhD Guelph - Professor and Dean, Ontario Agricultural College

Ernesto Guzman
DVM Mexico, MSc, PhD California (Davis) - Professor

Marc Habash
BSc Toronto, MSc Western, PhD Guelph - Assistant Professor

J. Christopher Hall
BSc, MSc Guelph, PhD Alberta - Professor

Beverley Hale
BSc, MSc Toronto, PhD Guelph - Professor and Associate Dean of Research, Ontario Agricultural College

Rebecca Hallett
BSc Toronto, MPM, PhD Simon Fraser - Associate Professor

Richard J. Heck
BSA, MSc, PhD Saskatchewan - Associate Professor

Thomas Hsiang
BSc, MSc British Columbia, PhD Washington - Professor

Shelley L. Hunt
BSc, PhD Guelph - Assistant Professor

John D. Lauzon
BSc, MSc, PhD Guelph - Associate Professor

Hung Lee
BSc British Columbia, PhD McGill - Professor

Steven A. Marshall
BSc (Agr) Guelph, MSc Carleton, PhD Guelph - Professor

Ray A. McBride
BSc (Agr), PhD Guelph - Professor

Jonathan A. Newman
BA, PhD State Univ. of New York - Professor and Director, School of Environmental Sciences

Gary W. Parkin
BSc, MSc Western, PhD Guelph - Associate Professor

Jonathan M. Schmidt
BSc, PhD Toronto - Associate Professor and Associate Dean, Ontario Agricultural College

Cynthia D. Scott-Dupree
BSc Brandon, MPM, PhD Simon Fraser - Professor

Paul K. Sibley
BSc, MSc Guelph, PhD Waterloo - Professor and Associate Director, Graduate Studies, School of Environmental Sciences

Jack T. Trevors
BSc, MSc Acadia, PhD Waterloo - Professor

Laura Van Eerd
MSc, PhD Guelph - Associate Professor

R. Paul Voroney
BSc Calgary, MSc, PhD Saskatchewan - Professor

Claudia Wagner-Riddle
BSc, MSc Sao Paulo, PhD Guelph - Professor and Associate Director, School of Environmental Sciences

Jon S. Warland
BSc Cornell, MSc UBC, PhD Guelph - Associate Professor

MSc Program

The objective of the MSc program is to develop and train graduate students that possess a high level of knowledge about the field of environmental science, expertise in specific aspects of environmental science (their thesis research focus), training in laboratory and field techniques, and excellence in writing and oral communication. With these skills, MSc students will possess a strong foundation on which they can be highly successful in science-related positions in government, industry, and consulting, or carry out high quality research at the PhD level.

Admission Requirements

The School’s admission standard for the MSc program is the same as the University and requires a four-year, honours science degree with a minimum B- (70-72%) average during the final two years (4 semesters) of full time undergraduate study. Meeting the minimum requirement (B-) does not guarantee entrance; depending on other criteria (e.g., letters of reference, standardized test scores, academic background relevant to the area to which the applicant has applied, degree of work experience in related fields of study) students may be considered for admission with provisional status. Students on provisional status must obtain a “B” average (70%) in at least two graduate courses during their first two semesters of study to continue in the program. Provisional students will be funded at the same level as regular students.

Degree Requirements

The MSc thesis program requires:

• At least 1.5 graduate course credits, including one mandatory 0.25 credit course (Graduate Seminar).

• 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. Through coursework and a research project, 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

This degree is subject to the same entry requirements as the thesis-based MSc.

Degree Requirements

Candidates for the MES must complete a minimum of 4.0 credits, Environmental Sciences Research Project ENVS*6500 U [1.0], Advanced Topics in Environmental Science, ENVS*6501 F [0.5], Seminar in Environmental Science, ENVS*6502 W [0.5], two credits from ENVS courses:
Environmental Sciences Research Project, ENVS*6500 may be completed at the University or as part of a placement with an approved non-academic agency. The project may include analysis of a data set (derived from lab, field, or computer simulation) related to the specialization chosen by the student including analyses and interpretations of relevant data (the student may or may not be involved in collecting the data), or major, critical literature review. The outcome of the research project will be presented to the department as a seminar and evaluated as a pass/fail.

PhD Program

The objectives of the PhD program are to develop highly competent, independent, creative, and critical scientists. Doctoral students of the SES graduate program will provide leadership as scholars in academic institutions, as managers and officers in the industrial research and development sector, research and policy branches within the government sector and in other social institutions. Research in the PhD program is expected to be original and novel, contribute significantly to the relevant research field, and published in high-quality peer-reviewed journals.

The PhD program has three areas of specialization:

- Earth and Atmospheric Sciences – Research areas include: soil biology and soil physics, sedimentology, geobiology, soil chemistry, geochemistry, atmospheric chemistry 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, epiphytotics, soil-plant interactions, biotechnology, molecular biology, forest systems, agroforestry, and climate change biology

Admission Requirements

Admission to the PhD program is generally restricted to students with a recognized MSc degree in a related field obtained with a minimum academic standing of “A-” (80%) in their postgraduate studies. Students who meet the minimum University requirement (73-76%) but not the School requirement (80%) may be considered depending on other criteria (e.g., letters of reference, standardized test scores, academic background relevant to the area to which the applicant has applied, degree of work experience in related field of study) for admission with provisional status. Students on provisional status must obtain an “A-” (80%) average in at least two graduate courses during their first two semesters of study to continue in the program. Provisional students will be funded at the same level as regular students. In exceptional cases, students may enter the PhD program directly from a BSc (Hons) if they have the minimum requirements as defined by the Office of Studies, University of Guelph.

Degree Requirements

The PhD program requires:

- Completion of one mandatory 0.25 credit course (Graduate Seminar).
- 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 a comprehensive report of the student’s research. The project is expected to represent a well-defined research problem, or hypothesis, and should be planned such that the research could normally be completed and the thesis defended in nine semesters (12 semesters for those students transferring from the MSc program). The research described in the thesis must represent a significant contribution to knowledge in that field. Emphasis is therefore placed on the quality of the presentation, maturity in scholarship, breadth and depth of the work, and critical judgement. Successful completion of the PhD thesis occurs when the research is judged to be sufficiently meritorious to warrant publication in reputable, peer-reviewed journals in its field. PhD students are normally expected to have published, or have “in-press”, one or more papers in peer-reviewed journals prior to the defense. In cases involving intellectual property, it is recognized that publication may not always be immediately possible. In such cases, a Pass will require that the committee is satisfied that, in their opinion, the work is of sufficient quality and originality that it would meet the standards for peer-reviewed publications.

Graduate Diploma Program

The objective of the Graduate Diploma is to provide highly focused training, education, and practical experience in Environmental Sciences. The Graduate Diploma is well-suited to recent undergraduate students, graduate students, and professionals seeking enhanced practical knowledge and experience associated with the application of current technologies and methods.

Admission Requirements

The minimum requirement for admission to the Graduate Diploma in Environmental Sciences is a baccalaureate, in an honours program or the equivalent, from a recognized university or college. The applicant must have achieved an average standing of at least second-class honours (B+ standing) in the work of the last four semesters or the last two undergraduate years (full-time equivalent). The program directors may waive some requirements for students with substantive work experience. Students will apply to the Department’s Graduate Admissions Committee through the normal University application process.

Degree Requirements

The Graduate Diploma requires:

- Completion of 2.0 credits (four courses 0.5 credit courses)

Students can complete the GDip in one semester by taking the following four courses:

- ENVS*6503 [0.50] Biogeochemistry of Wetlands
- ENVS*6504 [0.50] Classification and Assessment of Aquatic Systems
- ENVS*6505 [0.50] Soil Survey and Interpretation
- ENVS*6506 [0.50] Forest Ecosystems Patterns and Processes

Note

This program is suspended Summer 2012 - Winter 2013 but will be reintroduced May 2013.

Collaborative Programs

Toxicology MSc/PhD

The School of Environmental Sciences participates in the MSc/PhD program in toxicology. The faculty members’ research and teaching expertise includes aspects of toxicology; they may serve as advisors for MSc and PhD students.

Please consult the Toxicology listing for a detailed description of the MSc/PhD collaborative program and faculty associated with this program.

International Development Studies MSc

The School of Environmental Sciences participates in the MSc program in International Development Studies. Please consult the International Development Studies listing for a detailed description of this program.

Courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>ENVS*6000</td>
<td>Physical Environment of Crops and Forests F</td>
<td>0.50</td>
</tr>
<tr>
<td>ENVS*6040</td>
<td>Molecular Basis of Plant-Microbe Interactions F</td>
<td>0.50</td>
</tr>
<tr>
<td>ENVS*6050</td>
<td>Micrometeorology W</td>
<td>0.50</td>
</tr>
<tr>
<td>ENVS*6060</td>
<td>Meteorological Instrumentation W</td>
<td>0.50</td>
</tr>
</tbody>
</table>

Toxicology

- 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. Offered in even-numbered years.

- A lecture and seminar course on recent advances in the study of plant-microbe interactions. Topics included are the biochemical, physiological and genetic aspects of plant defenses and the interaction of plants with pathogenic and mutualistic bacteria, fungi and viruses. Offered in conjunction with PBIO*4000. Extra work is required of graduate students.

Meteorological Instrumentation

- 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. Offered in even-numbered years.

Environmental Microbial Technology

- 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. (Offered in alternate odd years.)

Meteorological Science

- The content is determined by the interests of the students and the availability of instructors. Topics may include aspects of statistics for climatology, animal biometeorology, air pollution meteorology, and hydrometeorology.
ENVS*6242 Special Topics in Atmospheric Science F,U [0.50]
See ENVS*6241

ENVS*6250 Soil Genesis and Classification F [0.50]
A discussion of world soil regions for students not specializing in soil genesis.

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.

ENVS*6340 Colloquium in Insect Systematics W [0.25]
Weekly discussions and seminars dealing with current topics in systematic entomology. (Offered in alternate odd years according to demand)

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. Offered in odd-numbered years.

ENVS*6360 Soil and Water Chemistry F [0.50]
Thermodynamics of soil solutions; solution-solid phase equilibria; reaction kinetics; computer modelling of solute-mineral interactions.

ENVS*6380 Advanced Soil Chemistry W [0.50]
The mathematical development of solute speciation models for aqueous solutions, surface complexation models for inorganic soil constituents and discrete and continuous functional group models for humic materials.

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.

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. Offered in even-numbered years.

ENVS*6451 Special Topics in Environmental Biology F,W,S [0.25]
This course provides graduate students, either individually or in groups, with the opportunity to pursue topics in the major areas of departmental specialization such as plant protection, entomology, and environmental management. This course may be offered in any of lecture, reading/seminar, or individual project formats.

ENVS*6452 Topics in Environmental Biology F,W,S [0.50]
See ENVS*6451

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.

ENVS*6501 Advanced Topics in Environmental Science F [0.50]
Using a case-study approach with material drawn from current and historical issues, students will develop an advanced understanding of current issues in environmental sciences, including the underlying science basis, how the issues was managed, and the effectiveness of associated policies.

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 discussions and debate on current environmental issues, and to learn about the practical skill set(s) required by various employment sectors in solving these issues.

ENVS*6503 Biogeochemistry of Wetlands S [0.50]
A two-week course covering concepts and techniques related to the geology and geomorphology of the southern Ontario landscape. Focus will be given to the characterization and interpretation of geology and Earth materials and their influence on soil and water processes at the landscape level.

ENVS*6504 Classification and Assessment of Aquatic Systems S [0.50]
A two-week course covering concepts and techniques related to the physiographical, hydrological, and biological characterization of aquatic systems. The course will involve periodic excursions to regional water bodies in southern Ontario for the purpose of demonstrating sampling techniques and conducting biological assessments.

ENVS*6505 Soil Survey and Interpretation S [0.50]
A two-week course covering concepts and techniques related to the characterization of soil in the landscape. Focus will be given to soils encountered in southern Ontario, and involves a multi-day excursion to examine the distribution of soils in this region.

ENVS*6506 Forest Ecosystems Patterns and Processes S [0.50]
A two-week course covering concepts and techniques 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 and metric determination.

ENVS*6520 Pollination Biology F [0.50]
Pollination biology is discussed from both entomological and botanical viewpoints, stressing fundamental and applied aspects. (Offered in the Fall semester or by arrangement with the professor.)

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 alternate even years.) Restriction(s): Credit may be obtained for only one of ENVS*6540 and ENVB*4100

ENVS*6550 Bioactivity and Metabolism of Pesticides W [0.50]
The basics of pesticide bioactivity will be examined, with emphasis on mode of action, structure-activity relationships and analytical methods. Students will participate in seminars and prepare a research paper and/or conduct a laboratory research project in consultation with the instructor(s). Students in this course are expected to attend the lectures for ENVS*6420.

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.

ENVS*6581 Special Topics in Soil Science U [0.25]
Issues that are relevant to the current research of faculty or visiting faculty. Generally presented as a combination of lectures, student seminars and written projects.

ENVS*6582 Special Topics in Soil Science U [0.50]
See ENVS*6581

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. (Offered only as needed)

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)

ENVS*6730 Special Topics in Environmental Earth Science U [0.50]
A study of principles and analyses of local environmental problems involving the application of geological and soil information of land use applications and possible hazardous conditions.

ENVS*6881 Special Topics in Land Resources Management U [0.25]
Issues that are relevant to the current research of faculty or visiting faculty. Generally presented as a combination of lectures, student seminars and written projects.

ENVS*6882 Special Topics in Land Resources Management U [0.50]
See ENVS*6881

ENVS*6900 Seminar F-W [0.25]
This course provides information and training in scientific presentations. Students will prepare a written essay based on their research and make oral presentation of the proposed studies. Students are expected to take this course in their second or third semester of study.
European Studies

European Studies information may be currently obtained at http://www.uoguelph.ca/eurostudies/

Administrative Staff

European Studies Coordinator
Margot Irvine (280 MacKinnon, Ext. 53182)
mirvine@uoguelph.ca

Graduate Coordinator
Alan McDougall (1013 MacKinnon, Ext. 53165 / 52885)
amcdoaug@uoguelph.ca

Graduate Secretary
Joanne G. Scheuer (269 MacKinnon, Ext. 53884)
jscheuer@uoguelph.ca

Graduate Faculty

Frédérique Arroyos
BA, MA, PhD Western Ontario - Associate Professor, School of Languages and Literatures, French Studies

Donald Bruce
BA Alberta, MA Queen's, PhD Toronto - Professor, School of Languages and Literatures, French Studies and Dean of the College of Arts

William Cormack
BA Calgary, MA Carleton, PhD Quebec - Associate Professor, History

Dawn Cornelio
BA, MA, PhD Connecticut - Associate Professor, School of Languages and Literatures, French Studies

Mary Michelle DeCoste
BA, MA Massachusetts, PhD Cornell - Associate Professor, School of Languages and Literatures, Italian Studies

Melissa Gabler
BA, MA Guelph, PhD McMaster - Assistant Professor, Political Science

Peter Goddard
BA British Columbia, DPhil Oxford - Associate Professor, History

Sally Hickson
BA Carleton, MA, PhD Queen’s - Assistant Professor, School of Fine Art and Music

Margot Irvine
BA, MA, PhD Toronto - Associate Professor, School of Languages and Literatures, French Studies

Sophie Lachapelle
BSc, MA Montreal, PhD Notre Dame - Assistant Professor, History

Jay Lampert
BA, MA, PhD Toronto - Associate Professor, Philosophy

MacDonald, David
BA Carleton, MA Ottawa, PhD London School of Business - Assistant Professor, Political Science

Dominic Marner
BA Regina, MA Victoria, PhD East Anglia (United Kingdom) - Assistant Professor, School of Fine Art and Music, Studio Art

Paola Mayer
BA Toronto, MA, PhD Princeton - Associate Professor, School of Languages and Literatures, German Studies

Alan McDougall
BA, MA, PhD Oxford - Assistant Professor, History

Jeff Mitscherling
BA California, MA McMaster, PhD Guelph - Professor, Philosophy

Ruediger Mueller
BA British Columbia, MA McGill, PhD Queen’s - Associate Professor, School of Languages and Literatures, German Studies

Padraig O’Cleirigh
BA, MA Ireland, PhD Cornell - Associate Professor, School of Languages and Literatures, Classics

Dorothy Odarayi-Wellington
BA Ghana, MA, PhD McGill - Associate Professor, School of Languages and Literatures, Spanish Studies

Sandra Parmegiani
Laurea, Dottorato Trieste, PhD Toronto - Assistant Professor

Omid A. Payrow Shabani
BA, MA Carleton, PhD Ottawa - Assistant Professor, Philosophy

Edward Phillips
BA Amherst, MA, MPhil, PhD Yale - Professor, School of Fine Art and Music, Music

John Potvin

BA Alberta, MA Carleton, PhD Quebec - Assistant Professor, School of Fine Art and Music, Studio Art

John Russon
BA Regina, MA, PhD Toronto - Associate Professor, Philosophy

Andrew Sherwood
BA Calgary, MA Victoria, MA, PhD Princeton - Associate Professor, School of Languages and Literatures, Classics

Howard Spring
BFA, MFA York, PhD Illinois - Assistant Professor, School of Fine Art and Music, Music

Ellen Waterman
BA Manitoba, MA, PhD California - Assistant Professor, School of Fine Art and Music, Music

Mary Woodsdie
BA, BMus McGill, AM, PhD Chicago - Associate Professor, School of Fine Art and Music, Music

MA Program

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 organisations or media groups.

The program offers two streams:

1. Exploring European Identities: 3 to 4 consecutive semesters in length, program requirements to be completed mainly at Guelph, with the option of a semester abroad (in France, Germany, Italy or Spain).

2. Crossways in Cultural Narratives, is offered through the University of Guelph’s participation in the Erasmus Mundus Consortium. This stream is 2 years in length (2 Fall and 2 Winter semesters) and involves a compulsory mobility component, whereby the student attends 3 different universities in 3 different member-states of the Consortium.

Admission Requirements

Admission requirements and procedure as well as program requirements for the two streams differ, and are listed separately below.

Exploring European Identities

Candidates for admission must hold a BA in an honours program or equivalent from a recognized university or college. The applicant must have achieved a grade average of at least B+ in the work of his/her last four semesters or last two undergraduate years (full-time equivalent). Applicants, normally, must have reading competence in one of French, German, Italian or Spanish, equivalent to third year undergraduate level. However, exceptions may be made for applicants who have lower degree of proficiency but have particularly strong qualifications in other respects.

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 (equivalent), or be among the top 5-10 students of their year. Applicants must also possess a near-native, degree-level command of TOWO of the following European Languages: English, French, Italian, Portuguese, and Spanish – together with a basic knowledge of, or a willingness to acquire, a THIRD European language.

Applications should be made through the Mundus Masters consortium.

Degree Requirements

Exploring European Identities

A minimum of 4.00 credits is required for completion of the M.A., to consist of the following:

1. A minimum of six semester courses, each worth 0.5 credits, including: a) Core courses: Team-taught courses on European Identities (EURO*6010) and Research Methods (EURO*6000); b) Electives: 2.0 credits to be chosen from a list of restricted electives.

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.

2012-2013 Graduate Calendar

May 13, 2014
Study Abroad
It is strongly recommended that students spend a term studying abroad, in a country where their core language is spoken. This is of particular importance for students who have not made study abroad a part of their undergraduate program. While abroad, students will have the opportunity to develop language proficiency by taking language courses, take courses toward degree requirements or conduct research for their major project. The minimum average for graduation is 70%.

Crossways in Cultural Narratives
A total of 6.00 credits (120 ECTS minimum) must be obtained: 4.00 for coursework, 1.75 for a thesis of 20,000 words (0.25 or 0.50 credits for the thesis proposal depending on whether students opt for an internship or not, 1.50 for the thesis). Students may opt for an internship worth 0.25 credits.

In compliance with the compulsory mobility component, students are required to obtain 2.00 credits (40 ECTS) from each of 3 universities chosen from the 8 member institutions:
- University of Perpignan Via Domitia, France
- University of Bergamo, Italy
- University of Guelph, Canada
- New University of Lisbon, Portugal
- Adam Mickiewicz University, Poland
- University of Santiago de Compostela, Spain
- University of Saint Andrews, United Kingdom
- University of Sheffield, United Kingdom

The required mobility pattern is as follows: Semester 1 – University A, Semesters 2 & 3 – University B (known as the home university), Semester 4 – University C.

For further details of the program and for downloadable application, visit the Crossways website.

Courses

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
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<tbody>
<tr>
<td>ECON*6370</td>
<td>Economic Development in Historical Perspective</td>
</tr>
<tr>
<td>GEOG*6400</td>
<td>Urbanization and Development</td>
</tr>
<tr>
<td>HIST*6300</td>
<td>Topics in Modern Europe I</td>
</tr>
<tr>
<td>HIST*6310</td>
<td>Topics in Modern Europe II</td>
</tr>
<tr>
<td>HIST*6380</td>
<td>Topics in Early Modern European History</td>
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<tr>
<td>PHIL*6140</td>
<td>Contemporary European Philosophy I</td>
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<td>PHIL*6150</td>
<td>Contemporary European Philosophy II</td>
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<tr>
<td>PHIL*6200</td>
<td>Problems of Contemporary Philosophy</td>
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<tr>
<td>UNIV*6500</td>
<td>International Study Option</td>
</tr>
<tr>
<td>PHIL<em>6900, HIST</em>6540, POLS<em>6950, GEOG</em>6060, ECON*6930</td>
<td>All are reading courses for special interests.</td>
</tr>
</tbody>
</table>

EURO*6000 Research Methods F [0.50]
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.

EURO*6010 European Identities W [0.50]
This core course examines historical and contemporary aspects 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.

EURO*6020 Myth, Fairy Tales and European Identities W [0.50]
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).

EURO*6030 Women and the Arts in Europe: Seeking Expression F [0.50]
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.

EURO*6040 Europe and the Discourse of Civilization U [0.50]
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.

EURO*6050 European Integration and the EU F [0.50]
This course examines the contributions of international relations, comparative politics, and/or governance/public policy to the study of European integration and the EU. Students will learn about the major concepts and theories of these sub-disciplines of political science to analyze the development, institutions, policy processes, policies, and politics of the EU.

EURO*6060 Social/Political Philosophy and European Studies
Family Relations and Applied Nutrition

The Department of Family Relations and Applied Nutrition offers MSc and PhD level graduate study in three fields:

- **Applied Human Nutrition (MSc, PhD)**
- **Family Relations and Human Development (MSc, PhD)**
- **Couple and Family Therapy (MSc)**

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 and Poultry Science.

Canadian Police Information Check

Various ministries within the Government of Ontario require that current criminal reference checks be completed for all students, volunteers and successful candidates for employment who care for, or provide service to, children or vulnerable adults. Students enrolled in practica or field placement courses will be required to submit to the agency with which they are placed, personal information about any criminal convictions and pending criminal charges. The cost of acquiring this criminal reference check from the student's local police department (Canadian Police Information Check) will be the responsibility of each student. Applicants to the MSc in the field of Couple and Family Therapy must submit the original results of this check to the Department of Family Relations and Applied Nutrition prior to beginning in September.

Administrative Staff

**Acting Chair**
Michael Nightingale (245 MINS, Ext. 56326)
mnightin@uoguelph.ca

**Associate Chair**
Janis Randall Simpson (219 MINS, Ext. 56321)
rjanis@uoguelph.ca

**Graduate Coordinator**
Robin Milhausen (219 MINS, Ext. 54397)
rmilhaus@uoguelph.ca

**Graduate Secretary**
Michelle Bateman (249 MINS, Ext. 53968)
frangs@uoguelph.ca

Graduate Faculty

**Lynda M. Ashbourne**
BSc McMaster, MSc, PhD Guelph - Assistant Professor

**John M. Beaton**
BA Wilfrid Laurier, MDiv Tyndale Theological Seminary, MSc Guelph, PhD Minnesota - Associate Professor

**Paula M. Brauer**
BHE British Columbia, MS Wisconsin, PhD Toronto - Associate Professor

**Andrea Breen**
BEd McGill, Ed M Harvard, PhD Toronto - Assistant Professor

**Andrea Buchholz**
BAA Ryerson, MSc Guelph, PhD Toronto - Associate Professor

**Susan S. Chuang**
BSc, MSc Toronto, MSc, PhD Rochester - Associate Professor

**Kerry J. Daly**
BA Carleton, MSc Guelph, PhD McMaster - Professor and Dean of College of Social & Applied Human Sciences

**John Dwyer**
BA Western Ontario, BEd Memorial, MA Western Ontario, PhD Saskatchewan - Associate Professor

**Jess Haines**
BSc Western Ontario, MHSs Toronto, PhD Minnesota - Assistant Professor

**Leon Kuczynski**
BSc, MA, PhD Toronto - Professor

**Tuuli M. Kukkonen**
BA Concordia, PhD McGill - Assistant Professor

**Donna S. Lerro**
BA SUNY at Stony Brook, New York, MS, PhD Purdue - Professor and Jarlskyslow Chair in Families and Work

**Susan Lollis**
BSc, MSc UC at Davis, PhD Waterloo - Professor

**Clare MacMartin**
BSc, MA Toronto, PhD Guelph - Associate Professor and Associate Dean, Academic, College of Social and Applied Human Sciences

**Scott B. Maitland**
BSc Buffalo State College, MSc, PhD Pennsylvania State - Associate Professor

**Robin R. Milhausen**
BA, MSc Guelph, PhD Indiana - Associate Professor and Graduate Coordinator

**Michele Preyde**
BSW Windsor, MSW Wayne State, PhD Toronto - Associate Professor

**Janis A. Randall Simpson**
BSc Toronto, PhD Guelph - Associate Professor and Associate Chair

**Carla Rice**
BA Harvard, MEd Toronto, PhD York - Associate Professor and Canada Research Chair

**Judy D. Sheeshka**
BHE British Columbia, PhD Guelph - Associate Professor

**Olga Sutherland**
BA, MA Trinity Western, PhD Calgary - Assistant Professor

**Joseph A. Tindale**
BA, MA McMaster, PhD York - Professor

MSc Program

**Applied Human Nutrition**

The MSc program in the field of Applied Human Nutrition 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. The MSc in Applied Human Nutrition normally requires two years of full-time study.

**Family Relations and Human Development**

The MSc program in the field of Family Relations and Human Development takes an interdisciplinary approach to the study of family dynamics and individual development across the lifespan. 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. The MSc in Family Relations and Human Development normally requires two years of full-time study.

**Couple and Family Therapy**

The MSc program in the field of Couple and Family Therapy is a program of study in theory, research, and practice, accredited by the Commission on Accreditation for Marriage and Family Therapy Education of the American Association for Marriage and Family Therapy. The curriculum is designed to produce sophisticated therapists and scholars by integrating contemporary theory, research competence, and systemic approaches to therapy in the understanding and treatment of couples, families, and individuals. This integrated course of study is coupled with high standards of professional and ethical conduct, attention to broader social issues that impact couples and families, and an emphasis on issues of diversity, power, and privilege. Applicants to this field have two options (1) thesis, and (2) non-thesis - by which to complete the degree. The thesis option is recommended for those students intending to pursue PhD studies at the University of Guelph or elsewhere. The MSc in Couple and Family Therapy requires two years of full-time study.

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., biology, biochemistry, human kinetics, and health studies) may be considered with suitable make-up work in core areas. Credit in the following undergraduate courses is normally required by all entering students:

1. a one-semester course in applied statistics within the last five years (minimum grade of 75%); 2) a one-semester course in research methods within the last five years (minimum grade of 75%); 3) a one-semester course in biochemistry; 4) a one-semester course in human physiology (at or beyond the second-year level); 5) two one-semester courses in human development/sociology/psychology/communications; 6) one 300-level and three 400-level one-semester courses in human nutrition. These requirements may be in progress at the time of application. Program offices should be consulted for admission deadlines.
Family Relations and Human Development

Admission requirements for the MSc program in the field of Family Relations and Human Development can be satisfied by applicants with honours degrees in a wide variety of undergraduate majors including family studies, child studies, psychology, sociology, and nursing. Credit in the following undergraduate courses is required of all entering students: 1) a one-semester course in applied statistics within the last five years (minimum grade of 75%); 2) a one-semester course in social-science research methods within the last five years (minimum grade of 75%); 3) a one-semester course in one of human development, child development, gerontology, or parent-child relations; 4) a one-semester course in one of family sociology, social psychology, family relations, family theory, or communications; 5) three 400-level (senior, fourth year) one-semester courses. Program offices should be consulted for admission deadlines.

NOTE: Department policy does not permit transfer applications from graduate students registered in the MSc in Family Relations and Human Development into the MSc in Couple and Family Therapy.

Couple and Family Therapy

General admission requirements for the MSc with an emphasis in Couple and Family Therapy are the same as noted for the MSc in Family Relations and Human Development (above). Relevant work and/or volunteer experience is an asset. The application must include an Overview of Professional Experience and Plans discussing the applicant’s motivation for Couple and Family Therapy graduate education (maximum 3 typed pages). There is no need for non-thesis applicants to the MSc in CFT to choose an advisor prior to making the application. Selected applicants are invited for an interview, and will have the opportunity to speak with potential advisors at that time. Applicants for the thesis stream only must also submit the Statement of Academic/Research Intent - a detailed, referenced, research plan outlining the relevance of the topic, the connection to faculty research interests and the specific research questions. Also for thesis applicants only, research advisors can be CFT faculty or faculty from the broader department. While CFT faculty do not have research discussions with thesis applicants prior to the application and selection process, thesis applicants can make prior contact with a potential research advisor in the Department if this is deemed an appropriate fit to applicant’s research interests.

The American Association of Marriage and Family Therapy (AAMFT) encourages applications from qualified students who are members of identified minorities. Scholarship aid is available to minority students on a competitive basis from AAMFT.

The most qualified applicants will be short-listed and invited to attend a day-long interviewing process with the Couple and Family Therapy faculty. Participation in the interview is required for admission. Applications from outside of Canada are welcome and external interviewing is appropriately explored. Program offices should be consulted for admission deadlines. Prior to beginning graduate studies in CFT, admitted students must submit a current police record check (CPIC - Canadian Police Information Check) from their local police department.

Degree Requirements

Applied Human Nutrition

For all students in the MSc program in the field of Applied Human Nutrition, a minimum of 2.75 graduate credits will be chosen in consultation with the student’s advisor and advisory committee including:

- FRAN*6000 [0.50] Research Methods
- FRAN*6010 [0.50] Applied Statistics
- FRAN*6020 [0.50] Qualitative Methods
- FRAN*6050 [0.50] Research Seminar

In addition, students must complete a research thesis. Most students must complete all additional elective graduate courses related to their program of study. These courses and research may emphasize, for example, community nutrition, therapeutic nutrition, and/or nutritional epidemiology. These courses may be taken within the department and in other academic units of the university including Biomedical Sciences, Capacity Development and Extension, Food, Agricultural and Resource Economics, Human Health and Nutritional Sciences, Political Science, Population Medicine, Rural Planning and Development, and Sociology and Anthropology.

Family Relations and Human Development

For all students in the MSc program in the field of Family Relations and Human Development, a total of 3.75 credits will be chosen in consultation with the student’s advisor and advisory committee.

Core courses include:

- FRAN*6000 [0.50] Research Methods
- FRAN*6010 [0.50] Applied Statistics
- FRAN*6020 [0.50] Qualitative Methods
- FRAN*6340 [0.50] Interdisciplinary Perspectives in Family Relations and Human Development
- FRAN*6330 [0.25] Research Seminar

In addition, students must complete a research thesis and are required to take a minimum of three (3) additional elective graduate courses (1.5 credits) related to their program of study.

Couple and Family Therapy

The intensive curriculum in Couple and Family Therapy has been designed to enable students to achieve an integration of theory, practice, and research. Clinical training in the MSc in CFT is guided by a systemic perspective, with emphasis on narrative, solution oriented, emotionally-focused and dialogic approaches. Attention to issues of gender, race, class, ethnicity, sexual identity, and culture as well as experiences of oppression and abuse are infused through all aspects of the curriculum.

Students are expected to develop competence in research. Students may choose to write a thesis, by conducting a research study, or they may choose the major research paper (non-thesis) option, and write a critical paper on a selected clinical topic. The thesis option is recommended for those students intending to pursue PhD studies at the University of Guelph or elsewhere. Thesis students will take additional courses to support their thesis research project (see the courses in the list below). Students completing the degree by the non-thesis option, take FRAN*6350, Major Paper.

Clinical training consists of four continuous practica (FRAN*6090) within the on-site Couple and Family Therapy Centre, plus an externship in a community agency (FRAN*6065). Prior to graduation the CFT student must accumulate 500 hours of direct therapy work with clients, with at least 250 hours (of the 500 hours) working with couples and/or families. Each practicum student receives a minimum of one hour of individual supervision for every five hours of client-in-session contact. In addition, each student participates in a weekly supervision group with a student to supervisor ratio of no more than 8:1. Supervision modalities include live supervision, live observation, video/audio-observation, and case consultation. All program faculty are Clinical Members and Approved Supervisors or Supervisor Candidates of the American Association for Marriage and Family Therapy (AAMFT).

For all students in the MSc in the field of Couple and Family Therapy, a minimum of 9.25 graduate credits are required, including the following:

- FRAN*6070 [0.50] Sexual Issues and Clinical Interventions Across the Life Span
- FRAN*6080 [0.50] Special Topics in Couple and Family Therapy
- FRAN*6090 [0.50] Practicum in Couple and Family Therapy
- FRAN*6095 [0.50] Externship in Couple and Family Therapy
- FRAN*6100 [0.50] Clinical Issues in Couple and Family Therapy
- FRAN*6120 [0.50] Theories and Methods of Family Therapy I
- FRAN*6130 [0.50] Theories and Methods of Family Therapy II
- FRAN*6140 [0.50] Professional Issues
- FRAN*6160 [0.50] Introduction to Systemic Practice in Couple and Family Therapy
- FRAN*6180 [0.50] Research Issues in Couple and Family Therapy

**Note**

* Students take FRAN*6090 and FRAN*6100 four times throughout their course of study. As such, each course totals 2.0 credits.

In addition to the above required courses, students take one restricted elective (0.50 credits) in the area of human or lifespan development. Course options for this restricted elective may include:

- FRAN*6200 [0.50] Special Topics in Family Relations and Human Development
- FRAN*6310 [0.50] Family Relationships Across the Life Span
- FRAN*6320 [0.50] Human Sexuality Across the Life Span
- FRAN*6340 [0.50] Interdisciplinary Perspectives in Family Relations and Human Development
- FRAN*6370 [0.50] Social Development During Childhood and Adolescence
- FRAN*6410 [0.50] Developmental Assessment and Intervention in Childhood and Adolescence

**Note**

* The special topic of FRAN*6200 must meet the COAMFTE criteria for individual development and family relations.

In addition, for Qualitative thesis students: Three additional courses are required:

- FRAN*6330 [0.25] Research Seminar
- FRAN*6600 [0.50] Research Methods
- FRAN*66010 [0.50] Applied Statistics

For Qualitative thesis students: Two additional courses are required:

- FRAN*6330 [0.25] Research Seminar
- FRAN*66020 [0.50] Qualitative Methods

For non-thesis students: One additional course is required:

- FRAN*6650 [1.00] Major Research Paper

Upon completion of the requirements for the emphasis in Couple and Family Therapy, the student will receive an MSc. The transcript will specify Family Relations and Human Development: Couple and Family Therapy.
MAN Program

The MAN program comprises one year (3 semesters) of graduate course work and competency-based practica. The program is designed to meet the professional practice requirements for becoming a registered dietitian and to foster practice based research skills development.

Students take graduate courses in the three broad areas of competency required for practice: foodservice management, clinical/assessment and community nutrition. These courses focus on the latest research in these fields and provide strong theoretical underpinnings for professional practice. Students increase their knowledge of the field while enhancing their skills in three areas: the research process, critical appraisal and communication. Assignments in the courses apply theories to practice in real-life situations.

Graduates will complete the entry-level competencies of Dietitians of Canada (DC). Completion of the competencies will qualify a graduate to write the Canadian Dietetic Registration Examination (CDRE) to become a member of the College of Dietitians of Ontario (CDO), or another provincial dietetic regulatory body. The program is accredited by Dietitians of Canada as a dietetic internship. The course work and practicum options permit the pursuit of interests in the various areas of dietetic practice, while meeting the required entry-level dietetic competencies. Students are charged a practicum fee for each semester of the program, in addition to the University academic and non-academic fees.

Admission Requirements

Students applying to the Master of Applied Nutrition program must have an honours degree within the previous three years from a dietetic program accredited by Dietitians of Canada. Applicants should have a minimum average of at least 75% in the last two years of their undergraduate program. Credit in the following courses is required prior to beginning the program: 1) a one-semester course in applied statistics within the last five years (minimum grade of 75%); and 2) a one-semester course in research methods within the last five years (minimum grade of 75%). These requirements may be in progress at the time of application.

All applications will be reviewed by a committee of Applied Human Nutrition (AHN) graduate faculty. The AHN faculty will interview the most qualified applicants, rank the candidates and forward recommendations to the Assistant VP of Graduate Studies. Program offices should be consulted for admission deadlines.

Degree Requirements

For all students in the MAN program, a minimum of 6.5 graduate credits are required, including the following required courses:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
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<tbody>
<tr>
<td>FRAN*6510</td>
<td>Nutrition in the Community</td>
</tr>
<tr>
<td>FRAN*6610</td>
<td>Advances in Clinical Nutrition/Assessment I</td>
</tr>
<tr>
<td>FRAN*6710</td>
<td>Practicum in Applied Human Nutrition I</td>
</tr>
<tr>
<td>FRAN*6720</td>
<td>Practicum in Applied Human Nutrition II</td>
</tr>
<tr>
<td>FRAN*6730</td>
<td>Practicum in Applied Human Nutrition III</td>
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<tr>
<td>FRAN*6740</td>
<td>Foodservice Management in Healthcare</td>
</tr>
<tr>
<td>FRAN*6750</td>
<td>Final Project in Applied Human Nutrition</td>
</tr>
</tbody>
</table>

PhD Program

Applied Human Nutrition

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.

Family Relations and Human Development

The PhD program in the field of Family Relations and Human Development is a course of study with a strong research focus, typically completed within four years (12 semesters). Each student works closely with an advisory committee to develop an individualized course of study that provides depth and addresses the student's specific research and professional goals. Building on core theory and methodology courses, students choose from professional and applied courses as well as courses on specialized topics. The PhD in FRHD has particular strengths in the following areas: child and adolescent development, parent-child and family relations, human sexuality, culture and acculturation, adult development and gerontology, evidence-based practice, well-being, and social policy.

Admission Requirements

Applied Human Nutrition

Students applying to the PhD program in the field of Applied Human Nutrition should have an MSc degree (or in progress) in human nutrition or a closely related field. Credit in the following courses is required prior to beginning the program: 1) a one-semester course in applied statistics within the last five years (minimum grade of 75%); 2) a one-semester course in research methods within the last five years (minimum grade of 75%); 3) a one-semester course in biochemistry; 4) a one-semester course in human physiology (at or beyond the second-year level); 5) two one-semester courses in human development/sociology/psychology/communications; and 6) one 300-level and three 400-level one-semester courses in human nutrition. A master's thesis is normally required for admission. These requirements may be in progress at the time of application.

Family Relations and Human Development

Students applying to the PhD program in the field of Family Relations and Human Development should have an MSc degree (or in progress) in Family Relations and Human Development or a closely related degree program (e.g., human development, gerontology, psychology, sociology, couple and family therapy, social work). Credit in the following courses is required prior to beginning the program: 1) a one-semester course in applied statistics within the last five years (minimum grade of 75%); and, 2) a one-semester course in research methods within the last five years (minimum grade of 75%). A master's thesis is normally required for admission.

Degree Requirements

Applied Human Nutrition

PhD students in Applied Human Nutrition are required to take a minimum of 3.75 credits that build a foundation for their research and/or practice:

<table>
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<tr>
<th>Course Code</th>
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<tbody>
<tr>
<td>FRAN*6000</td>
<td>Research Methods</td>
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<tr>
<td>FRAN*6610</td>
<td>Applied Statistics</td>
</tr>
<tr>
<td>FRAN*6620</td>
<td>Qualitative Methods</td>
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<tr>
<td>FRAN*6440</td>
<td>Applied Factor Analysis &amp; Structural Equation Modelling</td>
</tr>
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<td>Advances in Clinical Nutrition/Assessment I</td>
</tr>
<tr>
<td>FRAN*6620</td>
<td>Nutritional Epidemiology</td>
</tr>
<tr>
<td>FRAN*6550</td>
<td>Research Seminar</td>
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</tbody>
</table>

These required courses and any additional course work will be chosen in consultation with the student's advisor and committee and will depend upon the availability of offerings in the co-operating departments and schools.

The student's selection of elective courses is primarily determined by research specialization. Each of the emphases indicates some broad areas of research that reflect current faculty interests and is intended to help students define an area of research and study.

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:

<table>
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<th>Course Code</th>
<th>Title</th>
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<tbody>
<tr>
<td>FRAN*6000</td>
<td>Research Methods</td>
</tr>
<tr>
<td>FRAN*6010</td>
<td>Applied Statistics</td>
</tr>
<tr>
<td>FRAN*6020</td>
<td>Qualitative Methods</td>
</tr>
<tr>
<td>FRAN*6440</td>
<td>Applied Factor Analysis &amp; Structural Equation Modelling</td>
</tr>
<tr>
<td>FRAN*6340</td>
<td>Interdisciplinary Perspectives in Family Relations and Human Development</td>
</tr>
<tr>
<td>FRAN*6620</td>
<td>Theorizing in Family Relations and Human Development</td>
</tr>
<tr>
<td>FRAN*6630</td>
<td>Research Seminar</td>
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</tbody>
</table>

Most students take additional elective graduate courses related to their program of study. The student's selection of elective courses is primarily determined by research specialization. Each student works closely with an advisory committee in developing an individualized program of study by selecting courses that not only provide for interdisciplinary breadth but also address the student's specific research and professional goals. Each of the emphases also indicates areas of research that reflect current faculty interests and is intended to help students define an area of research and study.

Courses

Applied Human Nutrition

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
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<tbody>
<tr>
<td>FRAN*6510</td>
<td>Nutrition in the Community W [0.50]</td>
</tr>
</tbody>
</table>

Concepts and knowledge of nutrition as applied in community and public health nutrition. Examination of current programs in applied nutrition.

Restriction(s): Instructor consent required for non-FRAN students.
Instructor consent required for non-FRAN students.

FRAN6550 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.

FRAN6560 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. Instructor consent required for non-FRAN graduate students.

FRAN6610 Advances in Clinical Nutrition/Assessment I F [0.50]
An advanced overview of nutritional assessment and clinical nutrition with emphasis on issues relevant to community based and non-acute care settings. Nutrition assessment methods will be discussed in depth along with emerging issues. Emphasis on clinical nutrition will be integration of theory and practice.

Restriction(s): Instructor consent required for non-FRAN students.

FRAN6620 Nutritional Epidemiology W [0.50]
An investigation of selected non-communicable diseases. The emphasis is on epidemiologic methods and identification of nutritional risk factors. (Offered in alternate years.)

FRAN6710 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.

FRAN6720 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): FRAN6710
Restriction(s): For MAN students only.

FRAN6730 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): FRAN6720
Restriction(s): For MAN students only.

FRAN6740 Foodservice Management in Healthcare W [0.50]
Students will critically assess and integrate foodservice management literature and theories to address the multifactorial issues in foodservice operations in healthcare. Case studies presented by expert guests and operational projects will support student synthesis and evaluation of the literature.

Restriction(s): Instructor consent required for non-FRAN students.

FRAN6750 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.

Family Relations and Human Development

FRAN6000 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.

FRAN6010 Applied Statistics F [0.50]
Students will learn conceptual and practical applications of statistical analyses with emphasis on hypothesis formation, data screening, test selection, inferential statistics, univariate and multivariate analysis of variance/covariance (including repeated measures designs), simple and multiple regression, logistic regression, regression diagnostics, model building and path analytic techniques.

Co-requisite(s): FRAN6000
Restriction(s): Instructor consent required for non-FRAN students.

FRAN6020 Qualitative Methods W [0.50]
This course teaches students how to use qualitative methods as a mode of inquiry for understanding issues in human development, nutrition and family relationships. The emphasis is on project design, data collection techniques, analysis strategies and procedures for final write-up.

FRAN6070 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): Signature required.

FRAN6200 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 for non-FRAN graduate students.

FRAN6210 Program Evaluation U [0.50]
An examination of the theoretical principles and practical applications of evaluation issues and strategies. Special attention is given to services for children and families across the life span. (Offered in alternate years.)

FRAN6221 Evidence-Based Practice and Knowledge Translation U [0.50]
The principles of evidence-based practice are examined using various examples of psychosocial, behavioural and health interventions. The levels of evidence, criteria for efficacy and effectiveness, and the importance and limitations of evidence-based practice will be evaluated. The process of moving knowledge derived from high quality evidence into practice will be appraised throughout the course. Students will have the opportunity to build knowledge in their own areas of interest. (Offered in alternate years.)

FRAN6260 Practicum in Family Relations and Human Development U [0.50]
Supervised practicum experience in a variety of agencies or services. Interested students are encouraged to discuss this option with their faculty advisor. Placements are arranged on an individual basis subject to the requirements of students' programs of study and must be negotiated with faculty in advance of registration.

Restriction(s): Available to FRAN graduate students only.

FRAN6270 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. (Offered in alternate years.)

FRAN6280 Theorizing in Family Relations and Human Development U [0.50]
An examination of the meaning of science and theory in relation to the study of families and human development. Included is a discussion of the major social science paradigms including positivism, critical theory, social constructionism and post-modernity. This course is designed for doctoral students. (Offered in alternate years.)

FRAN6310 Family Relationships Across the Life Span U [0.50]
Considers theory and research on family and social relationships across the life span. Examples may include: parent-child, sibling, grandparent, couples, etc. (Offered in alternate years.)

FRAN6320 Human Sexuality Across the Life Span U [0.50]
This course covers research, theoretical and substantive issues relevant to studying human sexuality across the life span. Topics include: child and adolescent sexuality, sexual identity, sexuality in adulthood and old age, sexual assault, international research and sex education. (Offered in alternate years.)

FRAN6330 Research Seminar U [0.25]
Research literature in Family Relations and Human Development. Registration for this course occurs in semester 5 for MSc students and semester 7 for PhD students. Thesis students attend weekly seminars in each of the Fall and Winter semesters of their program of study.

Restriction(s): Available to FRAN graduate students only.

FRAN6340 Interdisciplinary Perspectives in Family Relations and Human Development W [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.

FRAN6370 Social Development During Childhood and Adolescence U [0.50]
A detailed study of factors important to social development and competence from infancy through adolescence. (Offered in alternate years.)

FRAN6410 Developmental Assessment and Intervention in Childhood and Adolescence U [0.50]
An examination of psychological difficulties encountered in childhood and adolescence. Special attention will be given to theoretical models used to explain childhood difficulties, categorization systems, assessment techniques, methods of intervention, as well as ethical issues specific to working with children and adolescence. (Offered in alternate years.)
**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. (Offered in alternate years)

*Prerequisite(s):* FRAN*6000, FRAN*6010

*Restriction(s):* Instructor consent required for non-FRAN students

**Couple and Family Therapy**

**Note**

The following courses are taken primarily by students in the Couple and Family Therapy emphasis. A limited number of spaces are available in some courses for students outside the Couple and Family Therapy area.

**FRAN*6080 Special Topics in Couple and Family Therapy U [0.50]**
This graduate seminar will feature research and practice issues in selected areas pertinent to the field of Couple and Family Therapy. Selected topics may vary from offering to offering.

**FRAN*6090 Practicum in Couple and Family Therapy* U [0.50]**
This course features supervised clinical practice in couple and family therapy. It involves regular clinical work with couples, families, and individuals. Students meet with faculty each week for up to six hours of supervision. Supervision over the semester will involve both group and individual/dyadic meetings.

*Restriction(s):* Available only to students in the Couple and Family Therapy program

**FRAN*6095 Externship in Couple and Family Therapy S [0.50]**
This is an advanced clinical practicum in Couple and Family Therapy. Students are placed in a community agency where they accumulate 10-15 hours per week (over 3 days) of direct clinical contact time. All clinical work is supervised by a clinical supervisor on site. Travel to the community agency is usually required.

*Prerequisite(s):* FRAN*6090

*Restriction(s):* Available only to students in the Couple and Family Therapy field of study

**FRAN*6100 Clinical Issues in Couple and Family Therapy* U [0.50]**
This course is taken four times in the two year program of study. Each offering features selected clinical issues; examination of each issue will include the socio-cultural context, theoretical location, and conceptual and practical implications for couple and family therapy.

*Restriction(s):* Available only to students in the Couple and Family Therapy field of study

**FRAN*6120 Theories and Methods of Family Therapy I W [0.50]**
This course will offer an historical perspective on the development of the field of couple and family therapy beginning with family systems therapy, through intergenerational models, to current constructionist approaches. Intervention methods consistent with these conceptual frameworks are examined. (Offered in alternate years.)

**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. (Offered in alternate years.)

**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.

**FRAN*6160 Introduction to Systemic Practice in Couple and Family Therapy F [0.50]**
An exploration of family process to understand diversity in family structures and functioning from a systemic conceptual framework. Applied activities in the associated tutorial section focus on developing basic communication, observational, and therapy skills. Student participation in small learning groups supports skill development and integration of theory and practice.

*Restriction(s):* Available only to students in the Couple and Family Therapy field of study

**FRAN*6180 Research Issues in Couple and Family Therapy F [0.50]**
The focus of this course is on research in Couple & Family Therapy, including issues related to evidence-based practice, therapeutic outcome, and therapeutic process. A selected review of quantitative and qualitative research methods and exemplary research is included. (Offered in alternate years.)

*Restriction(s):* Available to FRAN graduate students only.

**FRAN*6350 Major Research Paper U [1.00]**
The major research paper is an option open only to MSc students within the Couple and Family Therapy area. Students must demonstrate their ability to accurately synthesize and critically evaluate the literature in a specific area of interest. Detailed guidelines are provided.

*Restriction(s):* Available only to students in the Couple and Family Therapy field of study.

* Each of FRAN*6090 and FRAN*6100 are taken four consecutive semesters
Food, Agricultural and Resource Economics

The graduate program in Food, Agricultural and Resource Economics offers opportunities for master of science (MSc) and doctor of philosophy (PhD) studies in agricultural economics. The MSc and PhD are research-oriented degrees which require both course work and a thesis.

Administrative Staff

Chair
Alan P. Ker (314 MacLachlan, Ext. 53532)
aker@uoguelph.ca

Graduate Coordinator
John Cranfield (320 MacLachlan, Ext. 53708)
jcranfi@uoguelph.ca

Graduate Program Assistant
Kathryn Selves (311 MacLachlan, Ext. 52771)
fare@uoguelph.ca

Graduate Faculty

Andreas Boecker
MSc, PhD Kiel - Associate Professor

Maury E. Bredahl
BS, MS North Dakota State, PhD Minnesota - Professor

John A.L. Cranfield
BSc, MSc Guelph, PhD Purdue - Professor

Brady J. Deaton
BS Missouri, MS Virginia Tech, PhD Michigan State - Associate Professor

Glenn C. Fox
BSc (Agr), MSc Guelph, PhD Minnesota - Professor

Getu Hailu
BSc, MSc Alemaya, PhD Alberta - Associate Professor

Spencer Henson
BSc, PhD Reading - Professor

Alan Ker
BA Waterloo, MSc Guelph, PhD North Carolina State - Professor and Chair

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

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

Alfons J. Weersink
BSc Guelph, MSc Montana State, PhD Cornell - Professor

MSc Program

The MSc program in Food, Agricultural and Resource Economics focuses on two major areas of emphasis:

• Food and agricultural economics
• Natural resource and environmental economics

The aim of the MSc program is to develop in students a fundamental understanding of economic principles and their application in identifying and solving relevant problems related to food, agriculture, and natural resources. The program also strives to develop appropriate analytical, methodological, and communication skills to enable students to analyze agriculture and resource problems effectively and explain their findings.

Admission Requirements

All students entering the Master of Science program must have achieved the University required minimum 70% (B-) average or equivalent. In addition, they are expected to have already taken, the following basic courses:

• Intermediate level micro- and macro-economic theory (ECON*2310 and ECON*2410 or equivalent)
• Calculus and matrix algebra with applications to economics (ECON*2770 or equivalent)
• Intermediate level statistics (ECON*3740 or equivalent).

The Departmental Graduate Program Committee examines each application before the student is proposed to the School of Graduate Studies for admission into the program. Potential students are strongly encouraged to take an undergraduate course in advanced microeconomic theory as preparation for the course work in the MSc.

Thesis-based MSc Degree Requirements

In order to satisfy the degree requirements of the thesis-based MSc, students will complete successfully six taught 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*6970 [0.50] The Methodologies of Economics
FARE*6800 [0.00] Seminar in Agricultural Economics

Course-based MSc Degree Requirements

In order to satisfy the degree requirements of the course-based MSc, students will complete successfully seven taught courses, a seminar course and a research project course. The minimum course work requirements (assuming all undergraduate background requirements have been met) are:

FARE*6100 [0.50] The Methodologies of Economics
FARE*6380 [0.50] Applied Microeconomics for Agricultural Economists
FARE*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*6140 [1.00] Major Paper in Food, Agricultural and Resource Economics
FARE*6800 [0.00] Seminar in Agricultural Economics

PhD Program

The PhD program in Food, Agricultural and Resource Economics focuses on two major areas of emphasis:

• Food and agricultural economics
• 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 high second-class honors ('B' standing) 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 submit valid GRE (General exam only) scores directly to the department 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 Departmental Graduate Program Committee and approved by the Board of Graduate Studies. The student does not have to complete all the requirements of the MSc before transferring to the PhD program, but must achieve high academic standing.

Degree Requirements

Students enrolled in the PhD program must successfully complete a program of at least ten taught courses that prepare them for the various elements of the qualification examination and thesis research, as outlined below. However, students that are able to demonstrate a satisfactory level of competence in any of these requirements may have these course requirements adjusted accordingly, subsequent to evaluation and the decision of the Departmental Graduate Program Committee.

Microeconomic Theory:

ECON*6000 [0.50] Microeconomic Theory I
ECON*6010 [0.50] Microeconomic Theory II

Economic Research Methods:

ECON*6140 [0.50] Econometrics I
ECON*6160 [0.50] Econometrics II
FARE*6100 [0.50] The Methodologies of Economics
FARE*6970 [0.50] Applied Quantitative Methods for Agricultural Economists

Food, Agricultural and Resource Economics

FARE*6920 [0.50] Applied Policy Analysis II
FARE*6400 [0.50] Advanced Topics in Agricultural Economics
Plus ONE from the following:

FARE*6940 [0.50] Food Firms, Consumers and Markets II
FARE*6960 [0.50] Natural Resource Economics II

Plus ONE other graduate course approved by the student’s advisory committee.

Students may also be permitted to take other courses as substitutes for the above, subject to approval by the Departmental Graduate Program Committee.

Qualifying Examination

It should be noted that successful completion of the above courses is not necessarily sufficient for qualification to PhD candidacy.
Students are expected to complete successfully the qualifying examination in microeconomic theory that aims to assess a student's understanding of key theoretical concepts. Students are allowed two attempts at this qualifying examination. Students are expected to write the first attempt at this exam in the Summer semester of their first year and (i.e. their third semester in the program), if necessary, the second attempt in the Fall semester of their second year (i.e. their fourth semester in the program). Students that fail the examination at the second attempt will not be permitted to continue.

Collaborative Programs

International Development Studies MA/MSc/PhD

The Department of Food, Agricultural and Resource Economics participates in the International Development Studies (IDS) program. Please consult the International Development Studies listing for a detailed description of the MA/MSc/PhD collaborative programs including the special additional requirements for each of the participating departments.

Courses

Production Economics

FARE*6380 Applied Microeconomics for Agricultural Economists F [0.50]

The objective of this course is to foster a deeper understanding of standard microeconomic concepts and their application to a wide variety of topics in food, agricultural, and resource economics. Emphasis is placed on what tool(s) to use in a wide variety of circumstances to address real life problems. Topics will include decisions by firms and consumers, market equilibrium, and production decisions.

Prerequisite(s): ECON*2770 or equivalent, ECON*2310 or equivalent, ECON*3740 or equivalent

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

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 agrifood 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

FARE*6910 Applied Policy Analysis I W [0.50]

An overview of domestic and international agrifood policies and an introduction to the concepts and methods used to evaluate domestic trade policies.

Prerequisite(s): FARE*6380

FARE*6920 Applied Policy Analysis II U [0.50]

A presentation and evaluation of advanced quantitative agrifood policy models and selected special topics related to domestic and trade policy evaluation.

Prerequisite(s): AGEC*6910 or FARE*6910 or equivalent

Co-requisite(s): ECON*3710

FARE*6980 Agricultural Trade Relations W [0.50]

An examination of the institutional, theoretical and empirical aspects of international agrifood trade.

Prerequisite(s): One of AGEC*6910 or FARE*6910

Economics of Food Markets

FARE*6930 Food Firms, Consumers and Market I F [0.50]

This course examines the application of microeconomic theory to food markets. Topics covered include: optimizing behaviour by economic agents, the certainty equivalent profit model and decision making under risk, optimal capital replacement models and their application to food system economics, consumer behaviour with respect to food products and behaviour with respect to food products and behaviour of marketing intermediaries and food processors. New developments in the economic theory of the form are surveyed. (Offered in alternate years.)

Prerequisite(s): ECON*2310 or equivalent, ECON*3740 or equivalent

FARE*6940 Food Firms, Consumers and Markets II U [0.50]

This course builds on Food Firms, Consumers and Markets I by extending the breadth and depth of student's understanding and scope of economic analysis. Advanced techniques in producer and consumer theory, as well as advance market analysis techniques are presented and utilized. Understanding of the research process and advanced methods is emphasized throughout.

Prerequisite(s): AGEC*6930 or FARE*6930

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

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

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.

FARE*6140 Major Paper in Food, Agricultural and Resource Economics U [1.00]

The major paper is an option only available to MSc students registered in the course-based option 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 MSc program in FARE

FARE*6400 Advanced Topics in Agricultural Economics S [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.

FARE*6720 Readings in Agricultural Economics F,S,W [0.50]

A reading course on selected topics of special interest. May be offered to individual students or to groups of students in any semester.

FARE*6800 Seminar in Agricultural Economics U [0.00]

Students in the MSc program must give two presentations at the annual MSc research symposium; one in their first year outlining their research plan, and one in their second year on their thesis research results.
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

Chair
Art Hill (112 Food Science, Ext. 53875)
arhill@uoguelph.ca

FSQA Graduate Coordinator
Keith Warriner (126 Food Science, Ext. 56072)
kwarrine@uoguelph.ca

Graduate Secretary
Kay Norwell (201 CRIFS, Ext. 52183)
knorwell@uoguelph.ca

Graduate Faculty

Shai Barbut
Professor, Food Science

Herman J. Boermans
Associate Professor, Biomedical Sciences

Milena Corredig
Professor, Food Science

Lisa Duizer
Assistant Professor, Food Science

H. Douglas Goff
Professor, Food Science

Mansel W. Griffiths
Professor, Food Science

Arthur R. Hill
Professor and Chair, Food Science

Robert W. Lencki
Associate Professor, Food Science

Loong-Tak Lim
Associate Professor, Food Science

Alejandro G. Marangoni
Professor, Food Science

Massimo Marcone
Associate Professor, Food Science

S. Wayne Martin
Professor, Population Medicine

Scott A. McEwen
Professor, Population Medicine

Yoshinori Mine
Professor, Food Science

Peter Purslow
Professor, Food Science

Koushik Seetharaman
Associate Professor, Food Science

Jack T. Trevors
Professor, Environmental Biology

David Wallner-Toews
Professor, Population Medicine

Keith Warriner
Associate Professor, Food Science

Anne Wilcock
Associate Professor, Marketing and Consumer Studies

Rickey Y. Yada
Professor, 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 honors program (or the equivalent) or a DVM from a recognized university or college with an average standing of at least second-class honors (‘B’-average). Applicants will be expected to have completed undergraduate courses that prepare them for participation in the core graduate courses and electives of the program. Undergraduate upgrading may be necessary to ensure sufficient background in topics such as microbiology, toxicology, statistics, and analytical methods.

Degree Requirements

Completion of the 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. At least one course must be taken from each of three of the participating departments, including the department in which the student is registered. 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 honors program (or the equivalent) or a DVM from a recognized university or college with an average standing of at least second-class honors (‘B’-average). Applicants will be expected to have completed undergraduate courses that prepare them for participation in the core graduate courses and electives of the program. Undergraduate upgrading may be necessary to ensure sufficient background in topics such as microbiology, toxicology, statistics, and analytical methods.

Diploma Requirements

All students must complete the following five courses:

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

Courses

FSQA*6000 Food Safety and Quality Assurance Seminar S,F [0.50]
Provides experiential training in forms of communication that are likely to be required in professional or academic careers in food science and technology.

FSQA*6100 Food Law and Policy F [0.50]
The fundamentals of food policy development and Canadian and international food law are learned and practiced through online presentations, independent study and online interactions with other students and industry professionals.

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.

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.
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<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<td>FSQA*6500</td>
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<tr>
<td>FSQA*6600</td>
<td>Principles of Food Safety and Quality Assurance</td>
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**Other Graduate Courses Suitable for Credit in this Program**

### Biomedical Sciences
- BIOM*6440 Biomedical Toxicology [0.50]

### Engineering
- ENGG*6110 Food and Bio-Process Engineering [0.50]
- ENGG*6160 Advanced Food Engineering [0.50]

### Food Science
- FOOD*6190 Advances in Food Science [0.50]
- FOOD*6710 Special Topics in Food Chemistry [0.25]
- FOOD*6720 Special Topics in Food Microbiology [0.25]
- FOOD*6730 Special Topics in Food Physics [0.25]
- FOOD*6740 Special Topics in Food Processing [0.25]
- FOOD*6750 Special Topics in Food for Health [0.25]
- FOOD*6760 Special Topics in Food Quality [0.25]

### Human Heath and Nutritional Sciences
- HHNS*6400 Functional Foods and Nutraceuticals [0.50]
- HHNS*6410 Applied Functional Foods and Nutraceuticals [1.00]

### Pathobiology
- PABI*6000 Bacterial Pathogenesis [0.50]
- PABI*6550 Epidemiology of Zoonoses [0.50]

### Population Medicine
- POPM*6200 Epidemiology I [0.50]
- POPM*6210 Epidemiology II [0.50]
- POPM*6350 Safety of Foods of Animal Origins [0.50]

### Plant Agriculture
- PLNT*6110 Fruit and Vegetable Technology [0.50]

**Undergraduate Courses Suitable for Credit in this Program**

### Food Science
- FOOD*3030 Food Chemistry I [0.50]
- FOOD*4120 Food Analysis [0.50]
- FOOD*4090 Functional Foods and Nutraceuticals [0.50]

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

### Population Medicine
- POPM*4040 Epidemiology of Food-Borne Diseases [0.50]
**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. 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 Graduate Studies web site or the Food Science website.

**Administrative Staff**

Chair
Arthur Hill (112 Food Science, Ext. 53875) arhill@uoguelph.ca

Graduate Coordinator
Loong-Tak Lim (006A Food Science, Ext. 56586) llim@uoguelph.ca

Academic Secretary (106 Food Science, Ext. 52705) fsgrdsec.uoguelph.ca

**Graduate Faculty**

Shai Barbut
BSc Hebrew Univ. of Jerusalem, MS, PhD Wisconsin (Madison) - Professor

Milena Corredig
BSc Milano, MSc, PhD Guelph - Professor and Ontario Dairy Council/NSERC Industrial Junior Research Chair in Dairy Technology, Canada Research Chair

Lisa Duizer
BSc, MSc Guelph, PhD Massey - Assistant Professor and Graduate Coordinator

H. Douglas Goff
BSc (Agr) Guelph, MS, PhD Cornell - Professor

Mansel W. Griffiths
BSc North-East London Polytechnic, PhD Leicester - Professor and Ontario Milk Marketing Board Industrial Research Chair in Dairy Microbiology, Director Canadian Research Institute for Food Safety

Arthur R. Hill
BSc (Agr), MSc, PhD Guelph - Professor and Chair

Robert W. J. Lencik
BASc Toronto, MASC Waterloo, PhD McGill - Associate Professor

Alejandro G. Marangoni
BSc McGill, PhD Guelph - Professor, Canada Research Chair

Massimo F. Marcone
BSc, PhD Guelph - Associate Professor

Donald Mercer
BSc, PhD Waterloo - Associate Professor, Kemptville College

Yoshinori Mine
BSc, MSc Shinsyu, PhD Tokyo - Associate Professor and Egg Marketing Board Industrial Research Chair in Egg Material Science

Peter Purslow
BSc, PhD Reading - Professor

Koushik Seetharaman
BSc Gujarat Agricultural College, MSc Cornell, PhD Texas A&M - Associate Professor, Ontario Cereals Industry Research Chair

Loong-Tak Lim
BSc Acadia, PhD Guelph - Associate Professor

Keith Warriner
BSc Nottingham, PhD Aberystwyth - Associate Professor

Rickey Y. Yada
BSc, (Agr), MSc, PhD British Columbia - Professor, Canada Research Chair

**MSc Program**

**Thesis Master's Program Objectives**

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. This objective is accomplished through course work and departmental research seminars. Extensive laboratory and technical training is obtained by performing experiments under the supervision of a professor and advisory committee. A mandatory communication course also teaches effective oral and written communication. All these training aspects culminate through the writing of the MSc thesis. With this background, MSc graduates will be qualified to obtain positions with responsibility in government and the research, development and production sectors of the food and beverage industry.

**Admission Requirements**

To be considered for admission, applicants should hold an honours baccalaureate degree with at least a B average during the last two years of study. Supportive letters of reference are essential and should outline the applicant's strengths and weaknesses. Students whose first language is not English require a TOEFL score of at least 550 (paper-based), 80 (computer-based), or 96 (internet-based). To assist in identifying a suitable thesis advisor, applicants should submit a short statement of research interests. Admission into the department is contingent on the student obtaining a scholarship or Graduate Research Assistantship. Students may be admitted into the Fall, Winter or Summer semesters.

**Degree Requirements**

MSc students are required to register in at least three graduate courses, plus seminar (a minimum of 2.0 credits) and prepare an acceptable thesis. A graduate degree program form signed by the student and approved by the student's advisory committee will be submitted during the first semester for approval of the departmental graduate studies 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**

**Objectives**

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. Creativity and the ability to perform independent research is fostered by requiring PhD students to submit a written research proposal and defend it orally. Having obtained research skills during their MSc studies, PhD students are expected to conduct autonomous research. The preparation of a PhD thesis and scientific publications ensures that graduates have attained prowess in research and communication.

**Admission Requirements**

The usual requirement for admission into the PhD program is a research-based MSc degree with a minimum 'B-' average and supportive letters of reference. Students whose first language is not English require a TOEFL score of at least 550 (paper-based), 213 (computer-based), or 89 (internet-based). To assist in identifying a suitable thesis advisor, applicants should submit a short statement of research interests. Admission into the department is contingent on the student obtaining a scholarship or GRA. It is also possible for a student to transfer from the MSc program without completing a master's thesis if the student has an excellent academic record and shows a strong aptitude for research which can be expanded to the doctoral level. Students may be admitted into the Fall, Winter or Summer semesters.

**Degree Requirements**

The major emphasis in the PhD program is research and the preparation of an acceptable thesis. There are no specific course requirements except for a seminar course which provides training in technical communications. 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, written and oral, and evaluates the student's knowledge in the fields of food chemistry, food microbiology and food processing/engineering. In addition, the advisory committee is required to submit a written evaluation of the student's performance to date in research and the student's potential as a researcher. The PhD program is completed by the submission and successful defense of an acceptable thesis.

**Courses**

**General**

<table>
<thead>
<tr>
<th>FOOD6190 Advances in Food Science</th>
<th>[0.50]</th>
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</thead>
<tbody>
<tr>
<td>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.</td>
<td></td>
</tr>
</tbody>
</table>
### 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.

*Restrictions:* This course is only open to students in the MSc Food or PhD Food programs.

### 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.

### 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.

### 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.

### 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.

### 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.

### 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.

### Other Graduate Courses:
- HHNS*6410 Applied Functional Foods and Nutraceuticals
- PLNT*6110 Fruit and Vegetable Technology
French

Administrative Staff

Director
Clive Thomson (267 MacKinnon, Ext. 54891)
cthomson@uoguelph.ca

Graduate Coordinator
Dawn Cornelio (263 MacKinnon, Ext. 53186)
frenchm@uoguelph.ca

Graduate Secretary
Joanne Scheuer (269 MacKinnon, Ext. 53884)
jscheuer@uoguelph.ca

Graduate Faculty

Frédérique Arroyas
BA, MA, PhD Western Ontario - Associate Professor

Donald Bruce
BA Alberta, MA Queen’s, PhD Toronto - Professor and Dean of the College of Arts

Dawn Cornelio
BA, MA, PhD Connecticut - Associate Professor

Margot Irvine
BA, MA, PhD Toronto - Associate Professor

Stéphanie Nutting
BA Toronto, MA, PhD Queen’s - Associate Professor and Graduate Coordinator

Johbert Satyre
BA État d’Haiti, MEd, PhD Montréal - Associate Professor

Alain Thomas
BA York, MA, PhD Toronto - Professor

Clive Thomson
BA Trinity College, MA, PhD Toronto - Professor and Director of SOLAL

MA Program

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.

Fields of Study

Research and teaching fall within two main fields: I) Language in context II) Politics and aesthetics of Francophone literatures. Students may take a range of courses in Quebec, continental French, African and Caribbean literatures, as well as in intermediality, literary translation, sociolinguistics and the pedagogy of French as a second language.

Special Feature

This program offers an experiential service-learning practicum which takes place outside the classroom. Students choose from a list of volunteer activities approved by the School of Languages and Literatures. This practicum normally takes place in a Francophone milieu and is the equivalent of one academic course (0.5 credit).

Admission Requirements

The normal requirement for admission to the French MA program is the equivalent of an Honours degree in French studies from a recognized post-secondary institution with an overall average of B+ or equivalent. Applicants who do not have an Honours BA in French from a Canadian university may be required to take a short competence test and/or qualifying undergraduate courses prior to beginning graduate study. Students enter the program in September with full-time status.

Degree Regulations

Students are required to take a minimum of six semester courses (3.0 credits), with the service-learning placement counting as one of these courses. They are also required to write a 50 page mémoire (mini-thesis). Courses must be approved by the Graduate Coordinator and will normally be completed in four semesters on a full-time basis. The minimum average required for graduation from the program is a B or equivalent. All work is written in French. A successful defence of the mémoire (mini-thesis) is also required. 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 Co-ordinator in advance of the course being offered.

FREN*6000 Research Methods Seminar F [0.50]
This course will introduce students to the field and research methods of various disciplines and of interdisciplinary studies, and it will familiarize them with field-relevant research skills and methodologies.

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 W [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 F [0.50]
This course focuses on the works of major Francophone African and Caribbean fictional and theoretical works with particular attention being given to links between notions of cultural hierarchies, identity, métissage and creolization.

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 W [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 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
**Geography**

The Department of Geography offers programs of study leading to the degrees of MA, MSc and PhD in Geography, and MA/MSc and PhD in Collaborative International Development Studies. Details regarding faculty, areas of research, current research opportunities and application procedures are provided on the Department's web site http://www.uoguelph.ca/geography/

**Administrative Staff**

**Chair**

John Smithers (118A Hut, Ext. 53529)

jsmith@uoguelph.ca

**Graduate Coordinator**

Ben Bradshaw (120 Hut, Ext. 58460)

bbradsha@uoguelph.ca

**Graduate Secretary**

Nance Grieve (129a Hut, Ext. 56721)

geograd@uoguelph.ca

**Graduate Faculty**

Lorne P. Bennett

BA, MSc Guelph, PhD Ottawa - Associate Professor

Aaron Berg

BSc, MSc Lethbridge, MSc Texas -Austin, PhD California -Irvine - Associate Professor

Benjamin E. Bradshaw

BA Trent, PhD Guelph - Associate Professor and Graduate Coordinator

Jaclyn Cockburn

BSc, MSc, PhD Queen's - Assistant Professor

Evan Fraser

BA, MSc Toronto, PhD UBC - Associate Professor

Ze’ev Gedalof

BA, MSc Victoria, PhD Washington - Associate Professor

Noella Gray

BSc McGill, MA Western, PhD Duke - Assistant Professor

Robert Hawkins

BSc Queen's, MES, MA York, PhD Clark - Assistant Professor

Alice Hovorka

BA Queen's, MA Carleton, PhD Clark - Associate Professor, Associate Chair and Graduate Coordinator

Alun E. Joseph

BA Liverpool, MA Queen's, PhD McMaster - Professor

Richard G. Kuhn

BA Concordia, MA Victoria, PhD Alberta - Associate Professor

John B. Lindsay

BSc Nipissing, MS, PhD Western Ontario - Associate Professor

Janet E. Mersey

BA Mount Allison, MSc, PhD Wisconsin - Associate Professor and Associate Chair

Kate Parizeau

BASC McMaster, MSc, PhD Toronto - Assistant Professor

Jennifer Silver

BA Mount Allison, MA Western, PhD Simon Fraser - Assistant Professor

Barry Smith

BA, MA Auckland, PhD McMaster - Professor

John A. Smithers

BA Western Ontario, MA, PhD Guelph - Professor and Chair

Wanhong Yang

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

**Degree Requirements**

Students may undertake an MA or an MSc program in geography by thesis or by research project (the non thesis option). 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.

Students taking the non thesis 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 objective of the PhD program is to offer opportunities for advanced research within one or more of the three fields in the graduate program: socio-economic spaces and change, environmental management and governance, and biophysical systems and processes.

Doctoral students conduct research relating to these areas at various geographic scales, from the local to the global.

**Admission Requirements**

Applicants for the PhD program should have a recognized master's degree with an 80% ('A-') average in their postgraduate studies. Applicants must submit a statement of their research interests including some evidence of experience in their chosen research area. It is essential that applicants contact potential advisors in the department prior to submission of an application. Students are admitted in September. Program offices should be consulted for admission deadlines.

**Degree Requirements**

All students in the PhD program are required to complete the Geographic Scholarship and Research course during the first two semesters of study. The advisory committee may prescribe additional courses to help the student prepare for the qualifying examination and thesis research. All students in the PhD program must complete a qualifying examination and submit a satisfactory research proposal by the end of the fourth semester of study.

The qualifying examination has written and oral components and evaluates the student's knowledge of the broader scholarly field as well as the specific theoretical and empirical content of the intended research area. Submission and defence of an acceptable thesis on an approved topic completes the requirements of the PhD.

**Collaborative Programs**

**International Development Studies MA/MSc/PhD**

The Department of Geography participates in the MA and MSc programs in the collaborative International Development Studies (CIDS) programs. Consult the International Development Studies listing for a detailed description of the requirements of the program.

**Courses**

**Environmental Management and Governance**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>GEOG*6281</td>
<td>Environmental Management and Governance F</td>
<td>[0.50]</td>
</tr>
<tr>
<td>GEOG*6340</td>
<td>Human-Environment Relations W</td>
<td>[0.50]</td>
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<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>GEOG*6550</td>
<td>Environmental Modelling W</td>
<td>[0.50]</td>
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<tr>
<th>Course Code</th>
<th>Course Title</th>
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</thead>
<tbody>
<tr>
<td>GEOG*6610</td>
<td>Global Hydrology F</td>
<td>[0.50]</td>
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**Biophysical Systems and Processes**

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<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>GEOG*6330</td>
<td>Biotic Processes and Biophysical Systems U</td>
<td>[0.50]</td>
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<tr>
<th>Course Code</th>
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<tr>
<td>GEOG*6650</td>
<td>Environmental Modelling W</td>
<td>[0.50]</td>
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<tbody>
<tr>
<td>GEOG*6610</td>
<td>Global Hydrology F</td>
<td>[0.50]</td>
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Socio-Economic Spaces and Changes

**GEOG*6400 Urbanization and Development U [0.50]**
Analysis of the evolution of urban form and pattern in the developing world within the context of the global urban system. Examines national urban systems and implications for dispersed development and rural change. (alternate years)

**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. (alternate years)

**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's signature required

**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.

**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

**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. The course extends over two semesters (Fall and Winter).

**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's signature required
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 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 Interdepartmental Group on Scottish Studies, in the work of the Centre for International Programs, and the Historical 1891 Canadian Census Project. As well, the History Department at Guelph has formed, with the History Department of the University of Waterloo, a Consortium for Reformation Studies. Students are encouraged to begin their studies in the Fall or Winter semesters. Program offices should be consulted for submission deadlines.

Administrative Staff - Tri-University Program

**Director**
Andrew Hunt (1001 MacKinnon Extension, Ext. 58245)
dhunt@uwaterloo.ca

**Tri-University Secretary - Guelph**
Diane Purdy (2010 MacKinnon Extension, Ext. 53556)
dpurdy@uoguelph.ca

**Graduate Coordinator**
Sophie Lachapelle (2016MacKinnon Extension, Ext. 53214)
slachap@uoguelph.ca

**Graduate Secretary**
Michael Boterman (2010 MacKinnon Extension, Ext. 56847)
histgrad@uoguelph.ca

**Graduate Officer - Laurier**
Suzanne Zeller (2-128 DAWB - Laurier, Ext. 3813)
szeller@wlu.ca

**Graduate Secretary - Laurier**
Cynthia Wieg (4-135 DAWB - Laurier, Ext. 3389)
cwieg@wlu.ca

**Graduate Officer - Waterloo**
James Walker (HH112 - Waterloo, Ext. 33706)
jwalker@uwaterloo.ca

**Graduate Secretary - Waterloo**
Donna Lang (HH135 - Waterloo, Ext. 32297)
dlang@uwaterloo.ca

Graduate Faculty

<table>
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<th>Note</th>
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<tbody>
<tr>
<td>(*indicates approved PhD Advisors)</td>
</tr>
</tbody>
</table>

**Tara H. Abraham**
BSc McMaster, MA, PhD, IH PST Toronto - Assistant Professor

**Catherine Carstairs**
AB Harvard, Dip Ed McGill, MA, PhD Toronto - Associate Professor

**Bill Cormack**
BA Calgary, MA Carleton, PhD Queen's - Associate Professor

**Elizabeth L. Ewan**
BA Queen's, PhD Edinburgh - Professor and University Research Chair

**Peter A. Goddard**
BA, UBC, DPhil Oxford - Associate Professor and Chair

**Alan Gordon**
BA Toronto, MA, PhD Queen's - Associate Professor and Associate Chair / Graduate Coordinator

**Matthew C. Hayday**
BA Toronto, MA, PhD Ottawa - Associate Professor

**Susannah C. Humble Ferreira**
BA Trent, BEd Queen's, MA, PhD Johns Hopkins - Assistant Professor

**Kris E. Inwood**
BA Trent, MA, PhD Toronto - Professor (Joint appointment with Department of Economics and Finance)

**Kevin J. James**
BA, MA McGill, PhD Edinburgh - Associate Professor

**Femi Kolapo**

**Sofie Lachapelle**
BA, MA Montreal, PhD Notre Dame - Associate Professor

**Linda L. Mahood**
BA Saskatchewan, M Litt, PhD Glasgow - Professor

**Stuart G. McCook**
BA Toronto, MS Rensselaer PI, MA, PhD Princeton - Associate Professor and Associate Dean (Graduate Studies and Research)

**Alan McDougall**
BA, MSt, DPhil Oxford - Associate Professor

**Graeme Morton**
BA, PhD Edinburgh - Professor and Scottish Studies Foundation Chair

**Jacqueline Murray**
BA British Columbia, MA, PhD Toronto - Professor

**Susan Nance**
BA, MA Simon Fraser, PhD California (Berkeley) - Associate Professor

**Jesse S. Palsetia**
BA, MA, PhD Toronto - Associate Professor

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

**Norman D. Smith**
BA, MA, PhD British Columbia - Associate Professor

**Catharine A. Wilson**
BA Guelph, MA, PhD Queen's - Professor

**Renée Woringer**
BA St. Olaf College, MA, PhD Chicago - Assistant Professor

Graduate Faculty from Wilfrid Laurier University

**Gavin Brockett**
PhD Chicago

**Blain Chiasson**
PhD Toronto

**Cynthia Comacchio**
BA Glendon, MA York, PhD Guelph

**Adam Crerar**
PhD Toronto

**Darryl Dee**
PhD Emory

**Leonard G. Friesen**
BA Waterloo, MA, PhD Toronto

**Jeff Grishow**
PhD Queen's

**Erich Haberer**
PhD Toronto

**Robert Kristofferson**
BA Trent, Dip. H.S. Western Ontario, MA, PhD York

**John Laband**
PhD Natal

**Douglas A. Lorimer**
BA, PhD British Columbia

**Joyce Lorimer**
BA, PhD Liverpool

**Amy Milne-Smith**
BHum Carleton, MA Queen's, PhD Toronto

**David Monod**
BA, MA McGill, PhD Toronto

**Darren Mulloy**
PhD East Anglia, UK

**Susan Neylan**
PhD East Anglia, UK

**Blain Chiasson**
PhD Toronto
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 Scottish Studies Interdepartmental Group. 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 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 coordinating 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. The Tri-University Doctoral Program generally limits thesis preparation to eight fields of study - Canadian history; Scottish history; early modern European history; modern European history; Medieval history; Cold War Era history and World history.

**Admission Requirements**

Applications are considered by the Tri-University co-ordinating committee. Only students who are graduates of accredited universities and colleges are eligible for admission. Direct admission following a BA degree is permissible for outstanding applicants, but normally students will be admitted after they have obtained an MA in which they have received at least an A- standing. Since not all applicants can be admitted, close attention is paid to samples of applicants’ written work, to applicants’ transcripts and past records as a whole, and to their statements of research interests. Applicants from outside Canada whose previous education cannot be assessed readily may be required to demonstrate their knowledge by other means, such as the Graduate Record Examination. Non-Canadian applicants whose first language is not French or English are required to submit evidence of proficiency in the English language or pass the Test of English as a Foreign Language (TOEFL). A net score of 600 is required. Registration at one university for three degrees (BA, MA, PhD) is discouraged.

**Degree Requirements**

1. Professional Development Seminar (HIST*7000). All doctoral students attend the professional development seminar in their first year of the program. The seminar is designed to prepare students for success as a PhD student and for their future careers. A pass/fail grade will be assigned for the seminar.

2. Language requirement. If no specific language is required for the student’s research (as authorized by the student’s advisory committee), the second language will be French. The determination of the second language will be made by the student’s advisory committee during the first semester of the student’s registration in the program. The language exam will be offered every Fall and Winter semester and it is expected that a student will successfully complete the test of reading comprehension no later than the 6th semester following admission into the program.

3. PhD fields. Each student is required to demonstrate competency in one major and two minor areas. In the minor fields, competency is demonstrated by successful completion of two minor field seminars. In the major field, students must successfully complete a major field seminar and the qualifying written and oral examinations (HIST*7040 and HIST*7010). See the Tri-University History doctoral handbook.
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 primary principal/archival sources being used, a chapter or topic outline, and a clear explanation of the originality of the thesis. Grades will be SAT/UNS.

6. PhD thesis (HIST*7990). All students must complete, under the supervision of a tri-university doctoral program faculty member, an original research project on an advanced topic. Each student will be required to write and successfully defend a thesis of such cogency and originality as will represent a significant contribution to knowledge. The thesis will normally be between 50,000 and 90,000 words in length. University of Guelph regulations and procedures govern this process (see Degree Regulations).

## Courses - MA

### Canadian History

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIST*6230</td>
<td>Canada: Culture and Society U [0.50]</td>
<td>3</td>
</tr>
<tr>
<td>HIST*6231</td>
<td>Community and Identity U [0.50]</td>
<td>3</td>
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<tr>
<td>HIST*6280</td>
<td>Community and Identity Research U [0.50]</td>
<td>3</td>
</tr>
<tr>
<td>HIST*6290</td>
<td>Topics in North American History U [0.50]</td>
<td>3</td>
</tr>
<tr>
<td>HIST*6291</td>
<td>North American Research U [0.50]</td>
<td>3</td>
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### Scottish History

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<tr>
<th>Course Code</th>
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<tbody>
<tr>
<td>HIST*6150</td>
<td>Scottish Archival Research U [0.50]</td>
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<tr>
<td>HIST*6190</td>
<td>Topics in Scottish History I U [0.50]</td>
<td>3</td>
</tr>
<tr>
<td>HIST*6191</td>
<td>Scottish History Research U [0.50]</td>
<td>3</td>
</tr>
<tr>
<td>HIST*6200</td>
<td>Topics in Scottish History II U [0.50]</td>
<td>3</td>
</tr>
<tr>
<td>HIST*6201</td>
<td>Scottish History Research U [0.50]</td>
<td>3</td>
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</tbody>
</table>

### British History

<table>
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<tr>
<th>Course Code</th>
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<tbody>
<tr>
<td>HIST*6140</td>
<td>Topics in British History Since 1688 U [0.50]</td>
<td>3</td>
</tr>
<tr>
<td>HIST*6141</td>
<td>British History Research U [0.50]</td>
<td>3</td>
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</tbody>
</table>

### General

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIST*6000</td>
<td>Historiography I F [0.50]</td>
<td>3</td>
</tr>
<tr>
<td>HIST*6020</td>
<td>Historiography II W [0.50]</td>
<td>3</td>
</tr>
</tbody>
</table>

### Regressions

- Grades will be SAT/UNS.
- Depending on the expertise of the instructor, this course may concentrate on either the United States or Canada, or it may select an historical theme or themes common to the larger continent.
- This course will provide a thematic approach to the foundations of Western attitudes towards sexuality and gender, especially as they developed in premodern Europe. The complex interweaving of medicine, Christian law and theology, and popular practices and beliefs will be explored.
- This seminar course examines current issues in early modern European history as selected by instructor(s). Participants review current research and historiography, discuss the principal debates, and develop their own perspectives through encounter with primary source materials.
XX. Graduate Programs, History - Tri-University Program

HIST*6381 Early European Research U [0.50]
Continuation of HIST*6380 in which students prepare an indepth research paper based on primary sources.

HIST*6400 Major Paper U [1.00]
This is to be a major piece of research, based on the extensive use of primary sources. An oral examination of this work is required.

HIST*6450 Quantitative Evidence and Historical Methods U [0.50]
An overview of the use for historical research of quantitative evidence and methodologies.

HIST*6500 Topics in Global History U [0.50]
This is a topical course, that explores the history of processes that take place on a worldwide scale. These may include social, cultural, economic, or environmental processes.

HIST*6501 Global History Research U [0.50]
Continuation of HIST*6500 in which students prepare an indepth research paper based on primary sources.

HIST*6520 Topics in Latin American History U [0.50]
In-depth study of a particular event or process in Latin American history. Topics may include: religions, women, race and ethnicity, environment issues, intellectual history, or have a regional or temporal focus.

HIST*6521 Latin American Research U [0.50]
Continuation of HIST*6520 in which students prepare an indepth research paper based on primary sources.

HIST*6540 Topics in South Asian History U [0.50]
Topics in South Asian History will examine the history and historiography of imperialism and nationalism in India from 1757 to 1947.

HIST*6541 South Asian History Research U [0.50]
Continuation of HIST*6540 in which students prepare an indepth research paper based on primary sources.

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.

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.

HIST*7030 Language Requirement U [0.00]
A written demonstration of the student's knowledge of written French (or other appropriate second language).

HIST*7040 Major Field U [0.50]
The examination written following completion of the major field seminar and before the oral qualifying examination.

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/archival sources being used, a chapter or topic outline, and a clear explanation of the originality of the thesis. Graded SAT/UNS.

Restiction(s): For PhD students only.

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.

Restiction(s): For PhD students only.

The following courses are designed to study the central issues, ideas and historiography of the designated major field, within certain geographical and temporal limits. All seminar courses extend over two semesters. Students must register for the courses in each semester.

HIST*7100 Canadian History Major Seminar U [1.00]
HIST*7110 Scottish History Major Seminar U [1.00]
HIST*7120 Scottish History Major Seminar U [1.00]
HIST*7140 Early Modern European History Major Seminar U [1.00]
HIST*7150 Modern European History Major Seminar U [1.00]
HIST*7170 Race, Slavery, and Imperialism Major Seminar U [1.00]
HIST*7190 War and Society Major Seminar U [1.00]
HIST*7250 Cold War Era History Major Seminar U [1.00]
Offered annually
Restriction(s): Instructor's Signature Required

HIST*7260 Medieval History Major Seminar U [1.00]
Offered annually
Restriction(s): Instructor's Signature Required

HIST*7270 World History Major Seminar U [1.00]
Offered Annually
Restriction(s): Instructor's Signature Required

HIST*7590 World History Minor Seminar U [1.00]
HIST*7600 Canadian History Minor Seminar U [1.00]
HIST*7610 British History Minor Seminar U [1.00]
HIST*7620 Scottish History Minor Seminar U [1.00]
HIST*7630 Community Studies Minor Seminar U [1.00]
HIST*7640 Early Modern European History Minor Seminar U [1.00]
HIST*7650 Modern European History Minor Seminar U [1.00]
HIST*7660 Gender, Women and Family Minor Seminar U [1.00]
HIST*7670 Race, Slavery, and Imperialism Minor Seminar U [1.00]
HIST*7680 United States History Minor Seminar U [1.00]
HIST*7690 International History Minor Seminar U [1.00]
HIST*7700 Science, Medicine and Technology Minor Seminar U [1.00]
HIST*7710 Other Minor Seminar U [1.00]
HIST*7750 Cold War Era History Minor Seminar U [1.00]
Offered annually
Restriction(s): Instructor's Signature Required

HIST*7760 Medieval History Minor Seminar U [1.00]
Offered annually
Restriction(s): Instructor's Signature Required

HIST*7770 World History Minor Seminar U [1.00]
Offered Annually
Restriction(s): Instructor's Signature Required

HIST*7990 Doctoral Thesis U [2.00]
Students are required to write and successfully defend a thesis of such cogency and originality as will represent a significant contribution to knowledge. The thesis will normally be between 50,000 and 90,000 words in length. University of Guelph regulations and procedures govern this process.

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 areas of emphasis and the faculty associated with those areas are:

- Biomechanics
- Nutrition, Exercise and Metabolism
- Nutritional and Nutraceutical Sciences

Interdepartmental programs are available for students wishing to specialize in Bioinformatics, or Biophysics. Collaborative programs are available for students wishing to specialize in Neuroscience or Toxicology.

Administrative Staff

Chair
Lawrence L. Spriet (354 Animal Science/Nutrition Bldg., Ext. 53745)
lspriet@uoguelph.ca

Associate Chair
James B. Kirkland (335 Animal Science/Nutrition Bldg., Ext. 56693)
jkirklan@uoguelph.ca

Graduate Coordinator
Coral Murrant (350 Animal Science/Nutrition Bldg., Ext. 56173)
cmurrant@uoguelph.ca

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

Graduate Secretary
Andra Williams (352 Animal Science/Nutrition Bldg., Ext. 56356)
cbsghnsgrad@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. Better
BS, PhD Missouri - Associate Professor

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

Alison M. Duncan
BASc Guelph, MSc Toronto, PhD Minnesota - Associate Professor

David J. Dyck
BSc, MSc, PhD Guelph - Associate Professor

Terry E. Graham
BA & BPH, MSc, PhD Queen’s - Professor

Graham P. Holloway
BA McMaster, MSc Waterloo, PhD Guelph - Assistant Professor

Lorraine C. Jadeski
BSc Guelph, MSc Waterloo, PhD Western - Associate Professor

James B. Kirkland
BSc, PhD Guelph - Associate Professor

Michael I. Lindinger
BSc Victoria, MSc, PhD McMaster - Associate Professor

David W.L. Ma
BSc, PhD Alberta - Associate Professor

Kelly A. Meckling
BSc Calgary, PhD Toronto - Professor

Coral L. Murrant
BSc, PhD Guelph - Associate Professor

David M. Mutch
BSc Queen’s, PhD Lausanne - Assistant Professor

Genevieve Newton
Doctor of Chiropractic Nat'l U of Health Sciences (Chicago), MSc, PhD Guelph - Assistant Professor

Kerry Ritchie
BSc, PhD Guelph - Assistant Professor

Lindsay E. Robinson
BSc Acadia, PhD Alberta - Associate Professor

Jeremy Simpson
BSc, Guelph, PhD Queen’s - Assistant Professor

Lawrence L. Spriet


BSc Waterlool, MSc York, PhD McMaster - Professor and Chair
Lori A. Vallis
BSc, MA Ottawa, PhD Waterloo - Associate Professor
Amanda Wright
BSc, PhD Guelph - Associate Professor
David Wright
BPE Calgary, MSc Arizona State, PhD Ball State - Associate Professor
John L. Zettel
BS Waterloo, MSc, PhD Toronto - Assistant Professor

MSc Program

The focus of the graduate programs in the Department of Human Health and Nutritional Sciences is on physical activity and diet as powerful lifestyle determinants of human health. The interaction between genetics and environmental factors determines human health and lifestyle is a major component of our environment.

Our graduate programs offer advanced experiential learning experiences in the broad areas of nutritional and nutraceutical sciences, general and exercise physiology, and biomechanics within the focus of lifestyle, genetics and human health. Within these broad fields, the Department of Human Health and Nutritional Sciences addresses the issues at the level of the individual, not community or populations. The research efforts are focused on understanding the basic underlying biological aspects of health, which are further applied to understanding aging, neurological/sensory disorders and osteoarthritis, and chronic diseases such as cancer, cardiovascular disease, obesity, and type II diabetes.

The Department offers programs of study leading to an MSc by thesis and an MSc by coursework and project. Within the MSc thesis program students must complete a minimum of 1.5 graduate credits and defend an acceptable thesis which comprises an account of the student's research. Within the MSc coursework program students must complete a minimum of 4.0 graduate credits which include credits for research experience.

Admission Requirements

To be considered, applicants must meet the requirements of a four-year honours science degree with a minimum 75% average during the final two years or 4 semesters of undergraduate study. Applicants should have completed a course in statistics. Applicants 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 arrive at least one full semester (four months) before the expected date of admission. Applications from international students should arrive at least six months prior to the expected date of admission.

The College of Biological Science requests that all components of the application for graduate school including transcript(s), graduate certificate(s), grading scale(s), language test, reference letters, statement of interest and name of faculty advisor be received within two months of submission 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, you are strongly encouraged to view the "Before you Apply" and "Admission Process" webpages on the ADR Future Student's site.

On-line applications, required documents and instructions may also be found on the Office of Graduate Studies webpage or in the Graduate Calendar.

Completed applications should be submitted to the CBS Graduate Admissions Secretary

Degree Requirements

MSc by Thesis

Students must complete and defend an acceptable thesis which comprises a scientifically defensible account of the student's research on a particular, well-defined research problem or hypothesis. Such research should begin with the practical expectation that it could be completed and the thesis defended in not more than 5 semesters. Paramount to the notion of acceptability of the thesis is its quality with respect to problem identification, the approach used to address the problem, and the evaluation of the results.

In addition they must successfully complete courses totalling no fewer than 1.5 graduate credits. The graduate credits of course work will consist of:

a) at least one of:
- HHNS*6200 [1.00] Research Methods in Biomechanics
- HHNS*6700 [0.50] Nutrition, Exercise and Metabolism
- HHNS*6640 [0.50] Research Fronts in Nutritional and Nutraceutical Sciences

b) at least 1.0 credits of electives as determined with the Advisory Committee

MSc by Course Work and Project

Students must complete at least 4.0 graduate credits as follows:

- HHNS*6010 [0.50] Seminar in Human Health and Nutritional Sciences
- HHNS*6320 [0.50] Advances in Human Health and Nutritional Sciences Research

at least one of:
- HHNS*6910 [0.50] Basic Research Techniques and Processes

2012-2013 Graduate Calendar

May 13, 2014
The focus of the graduate programs in the Department of Human Health and Nutritional Sciences is on physical activity and diet as powerful lifestyle determinants of human health. The interaction between genetics and environmental factors determines human health and lifestyle is a major component of our environment.

Our graduate programs offer advanced experiential learning experiences in the broad areas of nutritional and nutraceutical sciences, general and exercise physiology and biomechanics within the focus of lifestyle, genetics and human health. Within these broad fields, the Department of Human Health and Nutritional Sciences addresses the issues at the level of the individual, not community or populations. The research efforts are focused on understanding the basic underlying biological aspects of health, which are further applied to understanding aging, neurological/sensory disorders and osteoarthritis, and chronic diseases such as cancer, cardiovascular disease, obesity, and type II diabetes.

Admission Requirements

Applicants must have a recognized master’s degree in a related field obtained with a minimum academic standing of 80% in their postgraduate studies, and the endorsement of a potential thesis advisor. Applicants should have completed a course in statistics. Under exceptional circumstances admission directly to a PhD program with an appropriate endorsement, ability 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 arrive at least one full semester (four months) before the expected date of admission. Applications from international students should arrive at least eight months prior to the expected date of admission.

The College of Biological Science requests that all components of the application for graduate school including transcript(s), graduate certificate(s), grading scale(s), language test, reference letters, statement of interest and name of faculty advisor be received within two months of submission through the OUAC portal. Applications that are incomplete after this time period will be closed.

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On-line applications, required documents and instructions may also be found on the Office of Graduate Studies webpage or in the Graduate Calendar.

Completed applications should be submitted to the CBS Graduate Admissions Secretary.

Degree Requirements

The major part of a student's time will be devoted to research in fulfillment of the dissertation requirement. Course work would be established through discussion with the student's Advisory Committee.

PhD students will become candidates for the PhD degree upon completion of a qualifying examination, which must be conducted not later than the fifth semester of the PhD program. The examination will be primarily research focused.

Thesis Requirements

Submission and defence of an acceptable dissertation complete the requirements for a PhD. An acceptable dissertation comprises a report of the candidate's research on a particular and well-defined research problem or hypothesis. It should represent a significant contribution to knowledge in that field. Emphasis is placed on the quality of the work judged by the expression of mature scholarship and critical judgment in the dissertation. Dissertation approval implies that it could be published in reputable, refereed journals in its field.

Courses

**HHNS*6000 Students Promoting Awareness of Research Knowledge S,F,W [0.25]**

This course will explore research communication through practical experience. The course will be part of the SPARK program in which students write, edit and coordinate a variety of news publications that highlight University of Guelph research activities for a wide range of audiences.

**Restriction(s):** Limited to HHNS MSc course work and project students only. Instructor's signature required.

**HHNS*6900 Basic Research Techniques and Processes S,F,W [0.50]**

With a faculty advisor, students will gain experience in basic aspects of scientific research. This will be accomplished through experience of one or more components of the scientific method in a laboratory setting. Objective outcomes will be evaluated and will include documentation of the experience in a written report.

**Restriction(s):** Limited to HHNS MSc course work and project students.

**HHNS*6910 Seminar in Human Health and Nutritional Sciences S [0.50]**

Students will develop their scientific communication skills by translating a specific body of knowledge on a chosen topic into a seminar. The class will also explore scientific process-oriented concepts and issues such as effective scientific communication and dissemination of results.

**Restriction(s):** Limited to HHNS MSc course work and project students only.

**HHNS*6920 Research Methods in Biomechanics F [1.00]**

This course covers the basic elements of biomechanics experimental data collection including instrumentation, analog-to-digital conversion, signal processing and analysis. Particular emphasis is placed on the areas of kinematics, electromyography and tissue mechanics.

**HHNS*6930 Advances in Human Health and Nutritional Sciences Research S,F,W [0.50]**

This course considers the relation of nutraceuticals, functional foods, designer foods, medical foods and food additives to foods and drugs. The course emphasizes the development and commercialization of nutraceuticals.

**HHNS*6940 Nutrition, Gene Expression and Cell Signalling W [0.50]**

This course emphasizes the role nutrients play as modulators of gene expression at the molecular level. The mechanisms by which nutrients modulate gene expression through specific cell signalling cascades are examined. (offered annually)

**HHNS*6950 Seminar in Human Health and Nutritional Sciences [0.50]**

This seminar covers the basic elements of biomechanics experimental data collection including instrumentation, analog-to-digital conversion, signal processing and analysis. Particular emphasis is placed on the areas of kinematics, electromyography and tissue mechanics.

**HHNS*69600 Functional Foods and Nutraceuticals F [0.50]**

This course provides the opportunity to study one topic of choice and involves literature research on a chosen topic. The course may stand alone (MSc thesis and PhD students) or provide the background information for an experimental approach to the topic (MSc course work and project students).

**HHNS*69610 Applied Functional Foods and Nutraceuticals W [1.00]**

This course prepares students to develop an innovative product or service from conceptualization to market entry considering regulatory, product development, safety/efficacy and market readiness issues. The course applies and integrates the concepts defined in HHNS*6400.

**HHNS*69640 Nutrition, Gene Expression and Cell Signalling W [0.50]**

A discussion of recent concepts in the relationships among nutrition, exercise and metabolism. Information from the molecular to the whole-body level will be presented with a focus on understanding nutrition and exercise in the human. Emphasis is placed on the development and testing of experimental hypotheses in these areas of research.

**HHNS*69700 Nutrition, Exercise and Metabolism F [0.50]**

Advanced topics will be presented to establish an in-depth understanding of current investigations in nutrition and exercise. Based on the integrated understanding of nutrition and exercise developed in HHNS*6700, the focus of this course will be to develop the student's ability to independently analyze original research investigations.

**HHNS*6910 Basic Research Techniques and Processes S,F,W [0.50]**

Working with a faculty advisor, students will gain experience in basic aspects of scientific research. This will be accomplished through experience of one or more components of the scientific method in a laboratory setting. Objective outcomes will be evaluated and will include documentation of the experience in a written report.

**Restriction(s):** Limited to HHNS MSc course work and project students. Instructor's signature required.
**HHNS*6920 Applied Research Techniques and Processes S,F,W [0.50]**

Under the supervision of a faculty advisor, students will gain practical experience in discipline-specific aspects of research. This will be accomplished through experience in a pre-arranged practicum in an applied setting. Objective outcomes will be evaluated and will include documentation of the experience in a written report.

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

**HHNS*6930 Research Project S,F,W [0.50]**

Under the supervision of a faculty advisor and building on knowledge gained from Basic or Applied Research Techniques and Processes, students will carry out a specific research project to its completion. Results will be documented in a written report and communicated through a scientific poster.

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

*Restriction(s):* Restricted to HHNS MSc. course work and project students. Instructor's signature required
The Department of Integrative Biology is comprised of faculty members in three overlapping areas of emphasis: Ecology, Evolutionary Biology and 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.

The Integrative Biology Graduate Program offers MSc and PhD degrees. The faculty members associated with the three areas of emphasis are:

- Ecology (ECO)
- Evolutionary Biology (EVO)
- Comparative Physiology (PHY)

Faculty in Integrative Biology also participate in the interdepartmental programs in Bioinformatics, Biophysics and in the collaborative programs Neuroscience and Toxicology.

Administrative Staff

Chair
Moira Ferguson (2480 Science Complex, Ext. 53598)
mmfergus@uoguelph.ca

Graduate Coordinator
Teresa Crease (1455 Science Complex, Ext. 52723)
tcrease@uoguelph.ca

CBS Graduate Secretary
Andrea McGrawal (3480 Science Complex, Ext. 56094)
cbsgrad@uoguelph.ca

Graduate Admissions Secretary
Karen White (3479 Science Complex, Ext. 52730)
cbsgrad@uoguelph.ca

Graduate Faculty

José D. Ackerman
BSc, PhD Cornell - Professor

Sarah J. Adamowicz
BSc Dalhousie, PhD Imperial College - Assistant Professor

James S. Ballantyne
BSc, MSc Guelph, PhD British Columbia - Professor

Nicholas J. Bernier
BSc McGill, Diploma in Aquaculture Malaspina College, MSc British Columbia, PhD Ottawa - Professor

Elizabeth G. Boulding
BSc British Columbia, MSc Alberta, PhD Washington - Professor

Christina M. Caruso
BA Oberlin College, PhD Illinois - Associate Professor

Karl A. Cottenden
MSc, PhD Katholieke - Associate Professor

Stephen S. Crawford
BSc Guelph, PhD Queen's - Assistant Professor

Teresa J.D. Crease
BSc, MSc Windsor, PhD Washington - Professor and Graduate Co-ordinator

Roy G. Danzmann
BSc, MSc Guelph, PhD Montana - Professor

Moira M. Ferguson
BSc, MSc Guelph, PhD Montana - Professor and Chair of Integrative Biology

John M. Fryxell
BSc, PhD British Columbia - Professor

Jinzhang Fu
BSc Chinese Academy, PhD Toronto - Associate Professor

Douglas S. Fudge
BA, MAT Cornell, MSc Guelph, PhD British Columbia - Associate Professor

Todd E. Gillis
BSc, MSc Guelph, PhD Simon Fraser - Associate Professor

Ryan Gregory
BSc McMaster, PhD Guelph - Associate Professor

Cortland K. Griswold
BSc Wisconsin, MSc Toronto, PhD British Columbia - Assistant Professor

Mehrrad Hajibabaei
BSc Tehran Azad, PhD Ottawa - Assistant Professor

Robert Hanner
BSc Eastern Michigan, PhD Oregon - Associate Professor and Associate Director Canadian Barcode of Life Research Network

Paul D.N. Hebert
BSc Queen's, PhD Cambridge, FRSC - Professor

Andreas Heyland
BSc, MSc Zurich, PhD Florida - Assistant Professor

Brian C. Hushard
BSc, MSc Alberta, PhD Toronto - Professor and Associate Dean of Academic, College of Biological Science

Frederic Laberge
BSc, MSc Laval, PhD Manitoba - Assistant Professor

Andrew MacDougall
BA Dalhousie, MSc York, PhD British Columbia - Associate Professor

Hafiz Maherali
BSc McGill, MSc, PhD Illinois - Associate Professor

Andrew G. McAdam
BSc McGill, MSc Western, MSc Alberta - Associate Professor

Kevin S. McCann
BA Dartmouth, MSc, PhD Guelph - Associate Professor

D. Gordon McDonald
BSc Western Ontario, MSc, PhD Calgary - Professor

Robert L. McLauchlin
BSc Windsor, MSc Queen's, PhD McGill - Associate Professor

Steven G. Newmaster
BSc Guelph, PhD Alberta - Associate Professor

Ryan Norris
BES Waterloo, MSc York, PhD Queen's - Associate Professor

Thomas D. Nudds
BSc, MSc Windsor, PhD Western Ontario - Professor

Beren W. Robinson
BSc, MSc Dalhousie, PhD Binghamton - Associate Professor

M. Alexander Smith
BSc Trent, MSc Trent, PhD McGill - Assistant Professor

Merritt R. Turetsky
BSc Villanova, PhD Alberta - Associate Professor

Glenn J. Van Der Kraak
BSc, MSc Manitoba, PhD British Columbia - Professor and Associate Dean of Research, College of Biological Science

Patricia A. Wright
BSc McMaster, PhD British Columbia - Professor

MSc Program

The Integrative Biology Graduate Program offers MSc degrees in each of three major areas of emphasis (fields): ecology, evolutionary biology and 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. Applicants 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 arrive at least eight months prior to the expected date of admission. The College of Biological Science requests that all components of the application for graduate school including transcript(s), graduate certificate(s), grading scale(s), language test, reference letters, statement of interest and name of faculty advisor be received within two months of submission 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, you are strongly encouraged to view the "Before you Apply" and "Admission Process" webpage on the ADR Future Student's site. NOTE: The name of a potential advisor(s) is required in order to complete the submission summary. On-line applications, required documents and instructions may also be found on the Office of Graduate Studies webpage or in the Graduate Calendar. Completed applications should be submitted to the CBS Graduate Admissions Secretary.
Degree Requirements

Students must complete and defend an acceptable thesis. In addition, they must successfully complete courses totaling not fewer than 1.5 credits. These credits must include the mandatory course IBIO*6630, Scientific Communication (0.50 credit)

An acceptable MSc thesis comprises a scientifically defensible account of the student's research on a particular, well-defined research problem or hypothesis. Such research should begin with the practical expectation that it could be completed and the thesis defended in not more than six semesters. Paramount to the notion of acceptability of the thesis is its quality with respect to the underlying rationale (problem identification), the approach used to address the problem, and the evaluation of the results. Final acceptance of the MSc thesis need not imply that the work is sufficiently meritorious to warrant publication in scholarly media, though the majority of MSc research in the department is published.

The department endorses the idea that graduate students in the Integrative Biology program should benefit from exposure to recent developments both within and between the major areas of emphasis. To that end, students may enroll in any of the regularly offered courses entitled "Advances in ...". A selection of subjects is given in each of the course descriptions below. Details of content, format and evaluation will be available in the Office of the Chair of the Department at least one semester prior to the semester in which the course is offered.

In addition, the department offers two "Topics in Advanced Integrative Biology" courses to provide students with the opportunity to study with individual faculty on specific topics in the faculty member's area of expertise. These courses may be taken by groups as either reading/seminar courses, or on an individual research-project basis. Students should approach individual faculty members to request supervision on individual research project courses; faculty members may be petitioned by students to offer, or may advertise, "Topics in Advanced Integrative Biology" courses at least one semester prior to the semester in which the course is to be offered.

PhD Program

The Integrative Biology Graduate Program offers PhD degrees for studies in each of the three major areas of emphasis (fields): ecology, evolutionary biology, and comparative physiology. The 3 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 components. These courses are coordinated by a single faculty member who should be consulted for more information.

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 possible. Applications should be received at least one full semester (four months) prior to the expected date of admission. Applications from international students should arrive at least eight months prior to the expected date of admission.

The College of Biological Science requests that all components of the application for graduate school including transcript(s), graduate certificate(s), grading scale(s), language test, reference letters, statement of interest and name of faculty advisor be received within two months of submission 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, you are strongly encouraged to view the "Before you Apply: 'Admission Process’ webpage on the ADR Future Student's site. NOTE: The name of a potential advisor(s) is required in order to complete the submission summary.

On-line applications, required documents and instructions may also be found on the Office of Graduate Studies webpage or in the Graduate Calendar

Completed applications should be submitted to the CBS Graduate Admissions Secretary.

Degree Requirements

The Integrative Biology program expects that the major part of the student's time will be devoted to research in fulfillment of the thesis requirement. For that reason, the department does not require that PhD students with an MSc degree take any courses. Students entering directly into the PhD program are required to take 1.0 course credits, which must include IBIO*6630, Scientific Communication (0.50 credit) in their first or second semester. Furthermore, advisory committees may, from time to time, require that a student take some prescribed or additional courses. Regardless, PhD students are expected to contribute and participate actively in the full academic life of the department, including regular attendance at departmental and inter-departmental seminars, and to provide leadership and counseling to undergraduate and MSc students.

PhD students will become candidates for the PhD degree upon successful completion of a qualifying examination with oral and written components, which should be conducted not later than the third semester of the PhD program. The exam evaluates students' knowledge in the general area of the intended research.

Submission and defence of an acceptable thesis complete the requirements for a PhD. An acceptable thesis comprises a report of the candidate's research on a particular and well-defined research problem or hypothesis. It should represent a significant contribution to knowledge in that field. Emphasis is placed on the quality of the work as judged by the expression of mature scholarship, critical judgment, and satisfactory literary style in the thesis. Thesis approval implies that the research is judged sufficiently meritorious to warrant publication in reputable, refereed journals in its field.

Courses

Ecology

IBIO*6000 Advances in Ecology and Behaviour U [0.50]

This is a modular 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. The course includes lectures and seminars in which the students participate. Offered annually.

IBIO*6040 Special Topics in Ecology U [0.50]

Students will explore aspects of ecology not otherwise covered in existing graduate courses. A program of study will be developed with a faculty advisor according to the student's requirements. Research papers, laboratory work and/or written and oral presentations may be required.

Evolutionary Biology

IBIO*6020 Advances 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.

IBIO*6060 Special Topics in Evolution U [0.50]

Students will explore aspects of evolution not otherwise covered in existing graduate courses. A program of study will be developed with a faculty advisor according to the student's requirements. Research papers, laboratory work and/or written and oral presentations may be required.

Comparative Physiology

IBIO*6010 Advances in Physiology U [0.50]

A modular course format in which several faculty members lecture and/or lead discussion groups in tutorials on advances in their areas, or related areas, of physiology. Topics may include metabolic adaptation to extreme environments, behavioural and molecular endocrinology, and exercise and muscle physiology. The course includes lectures and seminars in which the students participate. Offered annually.

IBIO*6090 Special Topics in Physiology U [0.50]

Students will explore aspects of physiology not otherwise covered in existing graduate courses. A program of study will be developed with a faculty advisor according to the student's requirements. Research papers, laboratory work and/or written and oral presentations may be required.

General

IBIO*6070 Topics in Advanced 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. Course topics will normally be advertised by faculty one semester prior to their offering. Courses may be offered in any of lecture, reading/seminar, or individual project formats. A minimum enrolment may be required for some course offerings.
**IBIO*6080 Topics in Advanced 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. Course topics will normally be advertised by faculty one semester prior to their offering. Courses may be offered in any of lecture, reading/seminar, or individual project formats. A minimum enrolment may be required for some course offerings.

**IBIO*6630 Scientific Communication U [0.50]**
The development and refinement of the skills of scientific communication, emphasizing 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.
International Development Studies

The International Development Studies (IDS) program provides a focal point for graduate teaching and research in the area of international development. The program combines training in a particular discipline with exposure to a broad range of social science perspectives. Faculty expertise encompasses various aspects of development in Asia, Africa, Eastern and Western Europe and the Americas.

Administrative Staff

Director
Sally Humphries (646 MacKinnon, Ext. 53542)
shumphr@uoguelph.ca

Graduate Coordinator
Kerry Preibisch (643 MacKinnon, Ext. 52505)
kpreibis@uoguelph.ca

Graduate Secretary
Catherine Badham (046 MacKinnon, Ext. 53461)
ids@uoguelph.ca

From Capacity Development and Extension

Graduate Coordinator
Allan Lauzon (145 Landscape Architecture, Ext. 53379)

Graduate Secretary
Sue Hall (100 Landscape Architecture, Ext. 56780)

From Economics

Graduate Coordinator
Thanasis Stengos (715 MacKinnon, Ext. 53917)

Graduate Program Assistant
Sandra Brown (723 MacKinnon, Ext. 56341)

From Engineering

Associate Director, Graduate Studies
Doug Joy (Thornbrough, Ext. 50948)

Graduate Secretary
Laurie Gallinger (1405 Thornbrough, Ext. 56187)

From English and Theatre Studies

Graduate Coordinator
Julie Cairnie (MCKN 438, Ext. 53248)

Graduate Secretary
Olga Petrik (427 MacKinnon, Ext. 56315)

From Food, Agricultural and Resource Economics

Graduate Coordinator
John Cranfield (320 MacLachlan, Ext. 53708)

Graduate Program Assistant
Kathryn Selves (311 MacLachlan, Ext. 52771)

From Geography

Graduate Coordinator
Ben Bradshaw (120 Hut, Ext. 58460)

Graduate Secretary
Nance Grieve (129a Hutt, Ext. 56721)

From History

Graduate Coordinator
Alan Gordon (2005 MacKinnon, Ext. 54460)

Graduate Secretary
Michael Boteram (2010 MacKinnon, Ext. 56847)

From Latin American and Caribbean Studies

Graduate Coordinator
Gordana Yovanovich (277 MacKinnon, Ext. 53180)

Graduate Secretary
Joanne Scheuer (267 MacKinnon, Ext. 53884)

From Philosophy

Graduate Coordinator
Patricia Sheridan (335 MacKinnon, Ext. 53219)

Graduate Secretary
Janet Thackray (348 MacKinnon, Ext. 56265)

From Political Science

Graduate Coordinator
Craig Johnson (until June 30th, 2012) (514 MacKinnon, Ext. 53531)

Graduate Coordinator
David MacDonald (effective July 1st, 2012) (508 MacKinnon, Ext. 58049)

Graduate Secretary

Renee Tavascia (527 MacKinnon, Ext. 56973)

From Sociology and Anthropology

Sociology Graduate Coordinator
Vivian Shalla (608 MacKinnon, Ext. 52195)

Public Issues in Anthropology Graduate Coordinator
Elizabeth Finnis (609 MacKinnon, Ext. 53234)

Graduate Secretary
Shelagh Daly (624 MacKinnon, Ext. 53895)

Collaborative Master's Program

Students wishing to pursue a Master's degree with the designation "International Development Studies" must enter the collaborative IDS program through a participating department.

Admission Requirements

Students must meet both departmental and collaborative IDS requirements. They must demonstrate familiarity with conceptual frameworks employed in the social sciences. More detailed information is available on the IDS Graduate website.

Degree Requirements

Students complete IDS core requirements and requirements designated for IDS students by the relevant department. Following are requirements for select departments; consult the IDS Graduate website for other departments. One IDS core course may be waived if a student has taken a comparable course at the senior undergraduate level.

IDS Master's Core Courses*

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>IDEV*6100</td>
<td>[0.50]</td>
<td>International Development Studies Seminar</td>
</tr>
<tr>
<td>One of:</td>
<td></td>
<td>Gender and Development</td>
</tr>
<tr>
<td>SOC*6460</td>
<td>[0.50]</td>
<td>Gender and Development</td>
</tr>
<tr>
<td>ANTH*6460</td>
<td>[0.50]</td>
<td>Gender and Development</td>
</tr>
<tr>
<td>CDE*6420</td>
<td>[0.50]</td>
<td>Communication for Social and Environmental Change</td>
</tr>
<tr>
<td>SOC*6420</td>
<td>[0.50]</td>
<td>Global Agro-Food Systems, Communities and Rural Change</td>
</tr>
<tr>
<td>ANTH*6420</td>
<td>[0.50]</td>
<td>Global Agro-Food Systems, Communities and Rural Change</td>
</tr>
<tr>
<td>SOl*6480</td>
<td>[0.50]</td>
<td>Work, Gender and Change in a Global Context</td>
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<tr>
<td>ANTH*6480</td>
<td>[0.50]</td>
<td>Work, Gender and Change in a Global Context</td>
</tr>
<tr>
<td>SOC*6270</td>
<td>[0.50]</td>
<td>Diversity and Social Equality</td>
</tr>
<tr>
<td>ANTH*6270</td>
<td>[0.50]</td>
<td>Diversity and Social Equality</td>
</tr>
<tr>
<td>SOC*6500</td>
<td>[0.50]</td>
<td>Social Movements in Latin America</td>
</tr>
<tr>
<td>One of:</td>
<td></td>
<td>Urbanization and Development</td>
</tr>
<tr>
<td>GEOG*6400</td>
<td>[0.50]</td>
<td>Urbanization and Development</td>
</tr>
<tr>
<td>GEOG*6450</td>
<td>[0.50]</td>
<td>Development Geography</td>
</tr>
<tr>
<td>EDRD*6050</td>
<td>[0.50]</td>
<td>Farming Systems Analysis and Development</td>
</tr>
<tr>
<td>RPD*6291</td>
<td>[0.50]</td>
<td>Rural Development Administration</td>
</tr>
<tr>
<td>One of:</td>
<td></td>
<td>Economic Development in Historical Perspective</td>
</tr>
<tr>
<td>ECON*6370</td>
<td>[0.50]</td>
<td>Economic Development in Historical Perspective</td>
</tr>
<tr>
<td>FARE*6600</td>
<td>[0.50]</td>
<td>Food Security and the Economics of Agri Food Systems in Developing Countries</td>
</tr>
<tr>
<td>ECON*6350</td>
<td>[0.50]</td>
<td>Economic Development</td>
</tr>
<tr>
<td>One of:</td>
<td></td>
<td>Development in Practice</td>
</tr>
<tr>
<td>POLS*6750</td>
<td>[0.50]</td>
<td>Development in Practice</td>
</tr>
<tr>
<td>POLS*6730</td>
<td>[0.50]</td>
<td>The Politics of Development and Underdevelopment</td>
</tr>
</tbody>
</table>

Note

*This does not apply to students in Anthropology, Engineering, Food, Agricultural and Resource Economics and Political Science. Please see specific departmental requirements sections below for required courses (both IDS and departmental or program).

Optional IDS Courses

Students in the collaborative program may undertake any course offered by a collaborating department with the permission of the instructor. There are also two optional interdisciplinary courses available:

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>IDEV*6000</td>
<td>[0.50]</td>
<td>Regional Context</td>
</tr>
<tr>
<td>IDEV*6500</td>
<td>[0.50]</td>
<td>Fieldwork in International Development Studies</td>
</tr>
</tbody>
</table>

Departmental or Program Requirements

Programs not listed below are designed by special arrangements. All departmental requirements are subject to change. Students should confirm the departmental course requirements with the respective Graduate Coordinator.

Public Issues in Anthropology (MA)

IDS Requirements:

<table>
<thead>
<tr>
<th>Course</th>
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</tr>
</thead>
<tbody>
<tr>
<td>IDEV*6100</td>
<td>[0.50]</td>
<td>International Development Studies Seminar</td>
</tr>
<tr>
<td>One of:</td>
<td></td>
<td>Urbanization and Development</td>
</tr>
<tr>
<td>GEOG*6400</td>
<td>[0.50]</td>
<td>Urbanization and Development</td>
</tr>
</tbody>
</table>
IX. Graduate Programs, International Development Studies

GEOG*6450 [0.50] Development Geography
EDRD*6050 [0.50] Farming Systems Analysis and Development
RPD*6291 [0.50] Rural Development Administration
One of: ECON*6370 [0.50] Economic Development in Historical Perspective
FARE*6600 [0.50] Food Security and the Economics of Agri Food Systems in Developing Countries
ECON*6350 [0.50] Economic Development
One of: POLS*6750 [0.50] Development in Practice
POLS*6730 [0.50] The Politics of Development and Underdevelopment

Departmental Requirements:
- Anthropological Theory
- Qualitative Research Methods
- Public Issues Anthropology
- The Politics of Development and Underdevelopment

Either a Thesis and one additional course or ANTH*6660 [1.00] Major Paper
and three additional courses

Capacity Development and Extension (MSc)
CDE*6070 [0.50] Foundations of Capacity Building and Extension
CDE*6260 [0.50] Research Design
One of: RPD*6380 [0.50] Application of Quantitative Techniques in Rural Planning and Development
EDRD*6000 [0.50] Qualitative Analysis in Rural Development
Two additional courses from the following group:
CDE*6290 [0.50] Special Topics in Capacity Building and Extension
CDE*6311 [0.50] Community Engagement and Public Participation
CDE*6320 [0.50] Capacity Building for Sustainable Development
CDE*6330 [0.50] Facilitation and Conflict Management
CDE*6410 [0.50] Readings in Capacity Building and Extension
CDE*6420 [0.50] Communication for Social and Environmental Change
CDE*6690 [0.50] Community Environmental Leadership
One additional course in other areas of research (open elective)
- A thesis OR CDE*6900 [1.00] Major Research Paper
- plus two more courses from the restricted electives group (see course list above)

Economics (MA)
ECON*6000 [0.50] Microeconomic Theory I
ECON*6020 [0.50] Macroeconomic Theory I
ECON*6940 [1.00] Research Project
One of: ECON*6050 [0.50] Introduction to Econometric Methods
AND
ECON*6180 [0.50] Econometric Methods
OR
ECON*6140 [0.50] Econometrics I

Engaging in Environmental Engineering or Water Resources Engineering

IDS Core Courses Required:
IDEV*6100 [0.50] International Development Studies Seminar
One of:
SOC*6460 [0.50] Gender and Development
ANTH*6460 [0.50] Gender and Development
CDE*6420 [0.50] Communication for Social and Environmental Change
SOC*6420 [0.50] Global Agro-Food Systems, Communities and Rural Change
ANTH*6420 [0.50] Global Agro-Food Systems, Communities and Rural Change
SOC*6480 [0.50] Work, Gender and Change in a Global Context
ANTH*6480 [0.50] Work, Gender and Change in a Global Context
SOC*6270 [0.50] Diversity and Social Equality
ANTH*6270 [0.50] Diversity and Social Equality
SOC*6500 [0.50] Social Movements in Latin America
One of: GEOG*6400 [0.50] Urbanization and Development
GEOG*6450 [0.50] Development Geography
EDRD*6050 [0.50] Farming Systems Analysis and Development
RPD*6291 [0.50] Rural Development Administration
One of: POLS*6750 [0.50] Development in Practice
POLS*6730 [0.50] The Politics of Development and Underdevelopment

Departmental Requirements:
- Six courses from the list of required graduate courses in Engineering (to be selected in consultation with advisor)
- A thesis OR ENGG*6080 [0.00] Engineering Seminar

English (MA)
Three English courses and a thesis OR
Four English courses and ENGL*6803 [1.00] Research Project

Food, Agricultural and Resource Economics (MSc)

IDS Requirements
IDEV*6100 [0.50] International Development Studies Seminar
One of:
SOC*6460 [0.50] Gender and Development
ANTH*6460 [0.50] Gender and Development
CDE*6420 [0.50] Communication for Social and Environmental Change
SOC*6420 [0.50] Global Agro-Food Systems, Communities and Rural Change
ANTH*6420 [0.50] Global Agro-Food Systems, Communities and Rural Change
SOC*6480 [0.50] Work, Gender and Change in a Global Context
ANTH*6480 [0.50] Work, Gender and Change in a Global Context
SOC*6270 [0.50] Diversity and Social Equality
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SOC*6500 [0.50] Social Movements in Latin America
One of: GEOG*6400 [0.50] Urbanization and Development
GEOG*6450 [0.50] Development Geography
EDRD*6050 [0.50] Farming Systems Analysis and Development
RPD*6291 [0.50] Rural Development Administration
One of: POLS*6750 [0.50] Development in Practice
POLS*6730 [0.50] The Politics of Development and Underdevelopment

Departmental Requirements:
- Thesis based MSc:
  - Applied Microeconomics for Agricultural Economists
  - Applied Quantitative Methods for Agricultural Economists
  - Applied Policy Analysis I
  - The Methodologies of Economics
  - Food Security and the Economics of Agri Food Systems in Developing Countries
  - Seminar in Agricultural Economics

- Seminar in Agricultural Economics
The collaborative PhD program in International Development Studies (IDS) provides an opportunity for advanced students to engage with interdisciplinary development theories and to conduct research on international development issues based on approaches of selected academic disciplines. The PhD program in IDS is undertaken jointly with a discipline-based degree. Students enter IDS through a collaborating department with a PhD program. At present these include Sociology; Political Science; Population Medicine; Geography; Food, Agricultural and Resource Economics; Economics; History; Engineering; Environmental Biology and Land Resource Science.

Admission Requirements

To be considered for admission, an applicant must have a recognized Bachelor's degree and a Master's degree in a relevant discipline or related interdisciplinary field. Applicants to the collaborative IDS program must meet the specific departmental admission requirements, which vary from one department to another. For information on the admission requirements and application deadlines of your selected department, please contact the relevant department directly.

In addition to the specific departmental admission requirements, 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.

Degree Requirements

Students complete requirements for the departmental degree as well as the IDS components which consist of two core courses, including an interdisciplinary course on theories and debates in development and a course on development research and practice. While the students have to successfully complete these courses to remain in the collaborative IDS program, they do not have to pass a separate qualifying examination in addition to the departmental qualifying exam. Furthermore, the expectation is that the IDS students’ PhD research will bridge two or more disciplines in a way that relates to the field of IDS.

For further information regarding course offering, please contact the IDS Graduate Secretary.

IDS PhD Core Courses

IDEV*6800 [0.50] Theories and Debates in Development
IDEV*6850 [0.50] Development Research and Practice

Departmental PhD Requirements

Departmental requirements are assigned in collaboration with the student’s home department. See respective departmental web pages.

Courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>IDEV*6600</td>
<td>Regional Context U</td>
<td>0.50</td>
</tr>
</tbody>
</table>

This reading course provides an opportunity for in-depth investigation about a particular region in preparation for a thesis, major paper or research project. The course normally is directed by the student's advisor.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credit</th>
<th>Description</th>
<th>Restrictions</th>
</tr>
</thead>
<tbody>
<tr>
<td>IDEV*6100</td>
<td>International Development Studies Seminar U [0.50]</td>
<td>0.50</td>
<td>A bi-weekly seminar discussion of issues which arise in the study of international development. Led by faculty and visitors from a variety of disciplines.</td>
<td></td>
</tr>
<tr>
<td>IDEV*6500</td>
<td>Fieldwork in International Development Studies U [0.50]</td>
<td>0.50</td>
<td>This course recognizes an intensive commitment to research in an archival repository, 'in the field' or at an appropriate development institution in Canada or abroad. The course normally is directed by the student's advisor in consultation with the advisory committee.</td>
<td></td>
</tr>
<tr>
<td>IDEV*6800</td>
<td>Theories and Debates in Development F [0.50]</td>
<td>0.50</td>
<td>This course examines recent approaches in development theory explaining international inequality, poverty and long-term change. It also investigates selected current debates in international development – such as food security, trade, good governance, sustainability or gender – from various discipline-based and interdisciplinary perspectives, and analyzes selected regional experiences of development.</td>
<td>Restricted to students in doctoral IDEV programs or instructor's consent.</td>
</tr>
<tr>
<td>IDEV*6850</td>
<td>Development Research and Practice W [0.50]</td>
<td>0.50</td>
<td>In this course students establish the linkages between their doctoral research topic and the wider field of development studies and practice. The course will examine development policies and projects, ethical issues related to (cross-cultural) development research, and relationships between research and development practice.</td>
<td>Restricted to students in doctoral IDEV programs or instructor's consent.</td>
</tr>
</tbody>
</table>
Landscape Architecture

The Landscape Architecture program offers courses of study leading to the Master of Landscape Architecture (MLA) degree.

Administrative Staff

Director, SEDRD
Wayne Caldwell (101 Landscape Architecture, Ext. 56420)
cwaldwel@uoguelph.ca

Graduate Coordinator
Karen Landman (105 Landscape Architecture, Ext. 53748)
klandman@uoguelph.ca

Graduate Secretary
Diana Foonen (100 Landscape Architecture, Ext. 56576)
dfoonen@uoguelph.ca

Graduate Faculty

Robert D. Brown
BSc Saskatchewan, MLA, PhD Guelph, FCELA, CSLA, SALA, ASLA - Professor
Lise Burcher
BLA, MLA Guelph - Associate Professor
Robert Corry
BLA Guelph, MLA Minnesota, PhD Michigan, ASLA - Associate Professor
John E. FitzGibbon
BA McMaster, MSc Wales, PhD McGill, MCIP, RPP - Professor
Larry B. Harder
BES Manitoba, MLA Harvard - Associate Professor
Sean Kelly
BLA Guelph, MSc (Planning) Guelph, CSLA, OALA, ASLA - Assistant Professor
Karen Landman
BLA, MSc Guelph, PhD Queen’s, OPPI - Associate Professor
Cecelia Paine
BLA Illinois, MLA Michigan, FCSLA, FASLA, OALA - Professor and Associate Dean of Graduate Studies
Nathan H. Perkins
BLA, MLA Illinois, PhD Wisconsin, FASLA - Associate Professor

MLA Program

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.

Admission Requirements

Admission to the MLA program is not restricted to holders of the BLA degree. Strongly motivated graduates of honours programs in a variety of disciplines may be admissible under the normal Faculty of Graduate Studies admission requirements. Well prepared applicants will have studied as broadly as possible in their undergraduate programs.

Application deadline and additional information on the MLA program at the University of Guelph can be obtained from our internet address at: http://www.uoguelph.ca/grad/LA/

Degree Requirements

Students are encouraged to relate their major emphasis in the MLA to their undergraduate discipline through course work and thesis.

Required Core

For the holder of a BLA with several subsequent years of significant professional experience:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Credits</th>
<th>Course Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>LARC*6380</td>
<td>0.25</td>
<td>Research Seminar</td>
</tr>
<tr>
<td>LARC*6600</td>
<td>0.50</td>
<td>Critical Inquiry &amp; Research Analysis</td>
</tr>
<tr>
<td>LARC*6610</td>
<td>0.50</td>
<td>Research Methods</td>
</tr>
<tr>
<td>LARC*6710</td>
<td>0.50</td>
<td>Special Study</td>
</tr>
</tbody>
</table>

1 Elective

Thesis

For the holder of a BLA without such professional experience:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Credits</th>
<th>Course Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>LARC*6380</td>
<td>0.25</td>
<td>Research Seminar</td>
</tr>
<tr>
<td>LARC*6430</td>
<td>0.50</td>
<td>Landscape Resource Analysis</td>
</tr>
<tr>
<td>LARC*6470</td>
<td>0.50</td>
<td>Integrative Environmental Planning</td>
</tr>
<tr>
<td>LARC*6600</td>
<td>0.50</td>
<td>Critical Inquiry &amp; Research Analysis</td>
</tr>
<tr>
<td>LARC*6610</td>
<td>0.50</td>
<td>Research Methods</td>
</tr>
<tr>
<td>LARC*6710</td>
<td>0.50</td>
<td>Special Study</td>
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</table>

1 Elective

Thesis

For holders of degrees other than the BLA:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Credits</th>
<th>Course Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>LARC*2240</td>
<td>0.50</td>
<td>Plants in the Landscape</td>
</tr>
<tr>
<td>LARC*6010</td>
<td>0.50</td>
<td>Landscape Architecture Studio I</td>
</tr>
<tr>
<td>LARC*6020</td>
<td>0.50</td>
<td>Landscape Architecture Studio II</td>
</tr>
<tr>
<td>LARC*6030</td>
<td>0.50</td>
<td>Landscape Architecture Studio III</td>
</tr>
<tr>
<td>LARC*6040</td>
<td>0.50</td>
<td>Landscape Architecture Studio IV</td>
</tr>
<tr>
<td>LARC*6120</td>
<td>0.50</td>
<td>Community Design</td>
</tr>
<tr>
<td>LARC*6340</td>
<td>0.25</td>
<td>Landscape History Seminar</td>
</tr>
<tr>
<td>LARC*6360</td>
<td>0.25</td>
<td>Professional Practice Seminar</td>
</tr>
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<td>LARC*6380</td>
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<tr>
<td>LARC*6430</td>
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<td>Landscape Resource Analysis</td>
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<td>Integrative Environmental Planning</td>
</tr>
<tr>
<td>LARC*6440</td>
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<tr>
<td>LARC*6610</td>
<td>0.50</td>
<td>Research Methods</td>
</tr>
<tr>
<td>LARC*6710</td>
<td>0.50</td>
<td>Special Study</td>
</tr>
</tbody>
</table>

Thesis

Interdepartmental Programs

Rural Studies PhD Program

Landscape Architecture participates in the PhD program in Rural Studies in the field of sustainable rural communities or sustainable landscape systems. Those landscape architecture faculty members whose research and teaching expertise includes aspects of rural studies may serve as advisors for PhD students. For further information consult the Rural Studies listing in this calendar.

Courses

Theory and Practice

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Credits</th>
<th>Course Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>LARC*6010</td>
<td>0.50</td>
<td>Landscape Architecture Studio I F</td>
</tr>
<tr>
<td>LARC*6020</td>
<td>0.50</td>
<td>Landscape Architecture Studio II F</td>
</tr>
<tr>
<td>LARC*6030</td>
<td>0.50</td>
<td>Landscape Architecture Studio III W</td>
</tr>
<tr>
<td>LARC*6040</td>
<td>0.50</td>
<td>Landscape Architecture Studio IV W</td>
</tr>
</tbody>
</table>

Landscape Analysis and Planning

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Credits</th>
<th>Course Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>LARC*6430</td>
<td>0.50</td>
<td>Landscape Resource Analysis F</td>
</tr>
</tbody>
</table>

Advisory Committee

Robert D. Brown, BLA, MLA Guelph, FCELA, CSLA, SALA, ASLA - Professor
Lise Burcher, BLA, MLA Guelph - Associate Professor
Robert Corry, BLA Guelph, MLA Minnesota, PhD Michigan, ASLA - Associate Professor
John E. FitzGibbon, BA McMaster, MSc Wales, PhD McGill, MCIP, RPP - Professor
Larry B. Harder, BES Manitoba, MLA Harvard - Associate Professor
Sean Kelly, BLA Guelph, MSc (Planning) Guelph, CSLA, OALA, ASLA - Assistant Professor
Karen Landman, BLA, MSc Guelph, PhD Queen’s, OPPI - Associate Professor
Cecelia Paine, BLA Illinois, MLA Michigan, FCSLA, FASLA, OALA - Professor and Associate Dean of Graduate Studies
Nathan H. Perkins, BLA, MLA Illinois, PhD Wisconsin, FASLA - Associate Professor

Graduate Coordinator
Diana Foonen (100 Landscape Architecture, Ext. 56576) dfoonen@uoguelph.ca

Administrative Staff
Wayne Caldwell (101 Landscape Architecture, Ext. 56420) wcaldwel@uoguelph.ca
Karen Landman (105 Landscape Architecture, Ext. 53748) klandman@uoguelph.ca
Diana Foonen (100 Landscape Architecture, Ext. 56576) dfoonen@uoguelph.ca

2012-2013 Graduate Calendar
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>LARC*6440</td>
<td>Environmental Design F [0.50]</td>
<td></td>
</tr>
<tr>
<td></td>
<td>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.</td>
<td></td>
</tr>
<tr>
<td>LARC*6470</td>
<td>Integrative Environmental Planning W [0.50]</td>
<td></td>
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<tr>
<td></td>
<td>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.</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Research Techniques and Practice</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>EDRD*6000 Qualitative Analysis in Rural Development</td>
<td>[0.50]</td>
</tr>
<tr>
<td></td>
<td><strong>LARC*6380 Research Seminar W [0.25]</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>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.</td>
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<tr>
<td></td>
<td><strong>LARC*6600 Critical Inquiry &amp; Research Analysis W [0.50]</strong></td>
<td></td>
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<tr>
<td></td>
<td>Students are introduced to critical inquiry as a method of evaluating information, design, and planning. The focus of the course is on the quantification and analysis of research data. Modelling and simulation are introduced and discussed in the context of planning, design, and research.</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>LARC*6610 Research Methods F [0.50]</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>An introduction to a broad array of research methods as they apply to landscape planning and design, with a focus on the connections between research and design. Emphasis is on developing foundations for the creation of appropriate research questions.</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>RPD*6170 Rural Research Methods</strong></td>
<td>[0.50]</td>
</tr>
<tr>
<td></td>
<td><strong>Independent Study</strong></td>
<td></td>
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<tr>
<td></td>
<td>LARC*6710 Special Study S,F,W [0.50]</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Independent study. A proposal for the content and product required for this course must be developed in conjunction with the student's Advisory Committee.</td>
<td></td>
</tr>
</tbody>
</table>
Latin American and Caribbean Studies

Administrative Staff

Director of the School of Languages and Literatures
Clive Thomson (267 MacKinnon, Ext. 54991)
c Thomason@uoguelph.ca

Graduate Coordinator
Gordana Yovanovich (277 MacKinnon, Ext. 53883 / 53180)
g yovanov@uoguelph.ca

Graduate Secretary
Joanne Scheuer (269 MacKinnon, Ext. 53884)
jscheuer@uoguelph.ca

Graduate Faculty

Kurt Annen
Dr rer pol (PhD) University of Fribourg, Switzerland - Assistant Professor, Economics

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

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

Cecil A. Foster
BA, MA, PhD York - Associate Professor, Caribbean Studies, Sociology

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

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, Director of International Development Studies

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

Kerry Preibusch
BA, MA Simon Fraser, PhD University of Reading - Associate Professor, Sociology

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

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

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

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

Terisa Turner
BA York, MA Oberlin, PhD London School of Economics - Associate Professor, Sociology

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

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

MA Program

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 in its collaboration with 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.

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 a high second-class standing (78% or higher) in the last two years of study. Preference will be given to students who have taken upper-level undergraduate courses in areas such as Latin American and Caribbean history, society, politics, development, literature, art, languages, and music. A reading knowledge of Spanish will be required. Students wishing to enter the program normally do so in September.

Degree Requirements

LACS students will either take option 1 or 2. Study Abroad is not mandatory but strongly recommended to all students.

Option 1: take 6 courses (3.0 credits) and write a major paper (1.0 credit). This option is recommended.

In addition to taking the four required courses 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 Latin American and Caribbean Identity and Culture II course. 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.

Option 2: take 4 courses (2.0 credits) and write a thesis

All students will take four required courses:

LACS*6000 [0.50] Research Methods Seminar
LACS*6010 [0.50] Latin American Identity & Culture I
LACS*6020 [0.50] Latin American Identity & Culture II
LACS*6030 [0.50] Globalization & Insecurity in the Americas

Students who choose to write their major paper or thesis from a social science perspective may replace LACS*6000 with SOC*6140 (F) or SOC*6140 (W) or SOC*6130 (W).

Collaborative Programs

International Development Studies MA

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 collaborative International Development Studies (IDS) program must enter the LACS program and satisfy both the LACS admission requirements and the IDS admission requirements. Please consult the collaborative International Development Studies listing for a detailed description of the MA collaborative program including the special additional requirements for each of the participating departments or programs.

Courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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<tbody>
<tr>
<td>ECON*6350</td>
<td>[0.50]</td>
</tr>
<tr>
<td>ECON*6370</td>
<td>[0.50]</td>
</tr>
<tr>
<td>ECON*6811</td>
<td>[0.50]</td>
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<tr>
<td>ECON*6861</td>
<td>[0.50]</td>
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<tr>
<td>FREN*6022</td>
<td>[0.50]</td>
</tr>
<tr>
<td>HIST*6500</td>
<td>[0.50]</td>
</tr>
<tr>
<td>HIST*6520</td>
<td>[0.50]</td>
</tr>
<tr>
<td>HIST*6521</td>
<td>[0.50]</td>
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<tr>
<td>POLS*6050</td>
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<tr>
<td>POLS*6250</td>
<td>[0.50]</td>
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<tr>
<td>SOC*6270</td>
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</tr>
<tr>
<td>SOC*6420</td>
<td>[0.50]</td>
</tr>
<tr>
<td>SOC*6460</td>
<td>[0.50]</td>
</tr>
<tr>
<td>SOC*6500</td>
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</table>

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>LACS*6000</td>
<td>[0.50]</td>
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</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>Course</th>
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</thead>
<tbody>
<tr>
<td>LACS*6010</td>
<td>[0.50]</td>
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</tbody>
</table>

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.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>LACS*6020</td>
<td>Latin American Identity &amp; Culture II</td>
<td>0.50</td>
</tr>
<tr>
<td>LACS*6030</td>
<td>Globalization &amp; Insecurity in the Americas</td>
<td>0.50</td>
</tr>
<tr>
<td>LACS*6040</td>
<td>Novel &amp; Nation in Spanish America</td>
<td>0.50</td>
</tr>
<tr>
<td>LACS*6050</td>
<td>Globalization &amp; Latin American Representation in Art</td>
<td>0.50</td>
</tr>
<tr>
<td>LACS*6100</td>
<td>Research Project</td>
<td>1.00</td>
</tr>
<tr>
<td>LACS*6200</td>
<td>Topics in Latin American and Caribbean Studies</td>
<td>0.50</td>
</tr>
</tbody>
</table>

**LACS*6020 Latin American Identity & Culture II [0.50]**
This course is a continuation of LACS*6010. Students going on an exchange may replace this course with a similar course taken at the exchange university. This course will study minority cultures and the relationship of the periphery and the centre. Feminist, queer, Latina/o and indigenous marginalized cultures will be studied in the context of Internationalism and Globalization.

**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.

**LACS*6040 Novel & Nation in Spanish America U [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.

**LACS*6050 Globalization & Latin American Representation in Art W [0.50]**
This course will examine the continuous flow of large, temporary high-profile identity-based “blockbuster” exhibitions based on Latin American and Caribbean art in Canada and the United States. These exhibitions play a key role as cultural agents, and raise questions of the concept of converging visual cultures.

**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 Committee.

**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 Co-ordinator signatures required. Course cannot be taken in first semester.
MA Leadership

The MA (Leadership) focuses on the challenges facing leaders in the public, private and not-for-profit sectors, with an emphasis on the interaction between, and interdependency of, these spheres. Successful completion of the MA (Leadership) degree involves a comprehensive program of theoretical study backed by significant practical experience and analysis. Participants will also undertake a formal self-assessment process to gain insight into their own strengths and weaknesses and their ultimate leadership potential.

As a full cost recovery program, the MA (Leadership) is designed to enable mid-career professionals to complete a graduate degree without interrupting their careers. Web-based distance courses are combined with brief summer sessions in Guelph and the completion of a major research project or students may also complete the MA (Leadership) degree by taking two additional elective courses in place of the Major Research Project with a Pass by Course option.

Admission Requirements

Minimum admission requirements are:

A four year undergraduate degree or its equivalent (from a recognized university or college) with an average of at least a “B–” (70-72%) in the last two years of study AND having completed at least five years of relevant work experience

OR

General degree, diploma and/or an acceptable professional designation AND having completed at least seven 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.

Applicants for the program must have confirmed access to appropriate computer hardware and software. The computer equipment to be used by participants must have adequate peripherals to support the learning system, including CD-ROM capability and a sound card. For information pertaining to computer equipment and software requirements contact the College of Management and Economics Executive Programs Office at 1-888-622-2474 or visit the MA (Leadership) web site at http://www.leadership.uoguelph.ca/. Participants are solely responsible to arrange for the purchase and maintenance of the recommended computer system and software.

Degree Requirements

On average participants allot 20 to 25 hours per week to study and participate in the program. This is an approximate number of hours and may vary depending on personal learning style. Participants normally complete the MA (Leadership) in 20 months. Normally, course modules are eight weeks in length and are completed in a pre-determined sequence, but some variations exist. Participants must complete the program within six years of commencement.

The MA (Leadership) involves a challenging combination of course work with the option of completing a research-based project. Six web-based courses (3.0 credits) and two residency courses (1.0 credit) must be completed, followed by either the completion of the major research project (1.0 credit) or by taking two additional courses (1.0 credit).

If completing a Major Research Project, faculty and senior executives at the participant’s workplace may jointly supervise the research project. The project requires a literature review, data collection, and data analysis, which culminates in a major paper. The MA (Leadership) may also be completed by coursework. Two additional elective courses can be substituted for the major Research Project provided that the student has selected at least two research intensive courses from among all of their electives.

Graduate Diploma in Leadership

Students admitted into the MA (Leadership) program have the option to exit the program following the successful completion of 2.50 credits from the list of courses below. Students who elect this option are awarded a Graduate Diploma in Leadership. The Diploma includes the basic elements of the graduate program although does not require students to complete all of the prescribed courses of the MA (Leadership) program nor a major research project.

The Graduate Diploma in Leadership is awarded to students who complete the following five courses (2.50 credits) but elect not to complete the full course of studies required for the degree, MA (Leadership).

<table>
<thead>
<tr>
<th>Courses</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>LEAD*6000 Foundations of Leadership</td>
<td>0.50</td>
</tr>
<tr>
<td>LEAD*6100 Theories of Leadership</td>
<td>0.50</td>
</tr>
<tr>
<td>LEAD*6200 Leadership of Organizational Change</td>
<td>0.50</td>
</tr>
<tr>
<td>LEAD*6300 Role of the Leader in Decision-Making</td>
<td>0.50</td>
</tr>
<tr>
<td>LEAD*6500 Ethics in Leadership</td>
<td>0.50</td>
</tr>
</tbody>
</table>

Courses

LEAD*6000 Foundations of Leadership S,F [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.

Restrictions: CME Executive Programs students only
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>LEAD*6100</td>
<td>Theories of Leadership S,F [0.50]</td>
<td></td>
<td>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. Restrictions: CME Executive Programs Students Only</td>
</tr>
<tr>
<td>LEAD*6200</td>
<td>Leadership of Organizational Change F,W [0.50]</td>
<td></td>
<td>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. Restrictions: CME Executive Programs students only</td>
</tr>
<tr>
<td>LEAD*6220</td>
<td>Strategic Leadership and Management W [0.50]</td>
<td></td>
<td>As a research intensive course in the MA Leadership, this course examines the conceptual and practical dimensions of strategic leadership and management in a variety of organizational, external and individual contexts using a selection of readings, discussions, case analyses and a final paper.</td>
</tr>
<tr>
<td>LEAD*6300</td>
<td>Role of the Leader in Decision-Making F,W [0.50]</td>
<td></td>
<td>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. Restrictions: CME Executive Programs students only</td>
</tr>
<tr>
<td>LEAD*6350</td>
<td>The Role of the Leader as Reflective Practitioner F</td>
<td></td>
<td>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. Restrictions: CME Executive Programs students only</td>
</tr>
<tr>
<td>LEAD*6400</td>
<td>Research Methods for Decision-Making S [0.50]</td>
<td></td>
<td>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. Restrictions: CME Executive Programs students only</td>
</tr>
<tr>
<td>LEAD*6500</td>
<td>Ethics in Leadership W,S [0.50]</td>
<td></td>
<td>Issues in the use and application of ethical standards by leaders are explored through examples from history, current events, novels, films and television. Relevant theory is applied to leadership examples to help students develop an ethical framework for the exercise of leadership skills. Restrictions: CME Executive Programs students only</td>
</tr>
<tr>
<td>LEAD*6720</td>
<td>Politics of Organizations W [0.50]</td>
<td></td>
<td>This elective course reviews a variety of theories and models that help to explain the behavioural underpinnings that influence and shape management and leadership processes within organizations. Examples from history and current events are explored to illustrate theory. Restrictions: CME Executive Programs students only</td>
</tr>
<tr>
<td>LEAD*6740</td>
<td>Coaching and Developing Others W [0.50]</td>
<td></td>
<td>This course will provide student with an opportunity to design developmental plans for direct reports, assess their coaching skills, and develop their coaching skills to support the development of others. Restrictions: CME Executive Programs students only</td>
</tr>
<tr>
<td>LEAD*6800</td>
<td>Personal Skill Self-Assessment S [0.50]</td>
<td></td>
<td>Using the &quot;Basis of Competence&quot; model, this course examines personal skills in four areas: Managing Self, Communicating, Managing People and Tasks, and Mobilizing Innovation and Change. The skills required to make smooth transitions from one job to another in a dynamic workplace will be explored. Restrictions: CME Executive Programs students only</td>
</tr>
<tr>
<td>LEAD*6900</td>
<td>Major Research Project W-S [1.00]</td>
<td></td>
<td>This course involves a directed research project leading to a referenced, professional report on a leadership problem or issue. Restrictions: CME Executive Programs students only</td>
</tr>
</tbody>
</table>
Literary Studies/Theatre Studies in English

Administrative Staff

Director
Alan Filewod (425 MacKinnon, Ext. 53268)
afilewod@uoguelph.ca

Graduate Coordinator
Ajay Heble (427 MacKinnon, Ext. 53445)
aheble@uoguelph.ca

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

Graduate Faculty

Christine Bold
MA Edinburgh, PhD University College London - Professor

Donnie Brand
BA, MA Toronto - Professor and University Research Chair

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

Julie Cairnie
BA Brock, MA, PhD York - Associate Professor and Graduate Coordinator

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 and Director

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

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

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

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

Smaro Kamboureli
BA Aristotelian, MA, PhD Manitoba - Professor and Canada Research Chair

Ric Knowles
BA, MA, PhD Toronto - Professor

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

Marianne Micros
BA Sweet Briar College, MA Bonaventure, PhD Western - Associate Professor

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

Daniel O’Quinn
BSc, MA Western, PhD York - Professor

Stephen D. Powell
BA Oberlin College, MA Indiana (Bloomington), PhD Toronto - Associate Professor

Pablo Ramirez
BA Yale, MFA Miami; MA, PhD Michigan - Associate Professor

Paul W. Salmon
BA Western, MA Toronto, PhD Western - Assistant Professor

Jennifer Schacker
BA McGill, MA, PhD Indiana - Associate Professor

Sandra Singer
BA Trent, MA Queen’s, PhD Cambridge - Associate Professor

Jerrard Smith
Associate Ontario College of Art - Professor

J.R. (Tim) Struthers
BA, MA, PhD Western Ontario - Associate Professor

Ann Wilson
BA, MA, PhD York - Associate Professor and Associate Dean of Arts and Social Science Science

PhD Program

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

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 Studies 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. Graded on a P (Pass) / F (Fail) basis.

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 Studies Committee.

The aim is to test the student's ability to read critically in another language rather than to demonstrate mastery of translation. Assessment of the student's reading proficiency is based on both:

- 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, and
- a written analysis (in English) of approximately 500 words of the passage's critical implications.

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.

Evidence that a student has already demonstrated similar language ability at another university before admission may be submitted to the Graduate Studies Committee with a request to have the language requirement waived. Credit may be given, at the discretion of the Graduate Studies Committee, to any student who has fulfilled the equivalent language requirement through an MA-level examination. Credit will not normally be given for the completion of an undergraduate-level language course.

Secondary Area Qualification

The SAQ takes place in the Summer of Year One and provides an opportunity for students to quickly develop the repertoire needed to potentially teach in a field without necessarily committing to that field as an area of specialization. The objective here is to gain working knowledge of the major texts and statements relating to a field of scholarly enquiry. Upon completion of this exercise, students should have both the range and the depth to confidently teach in a secondary area.
As the name implies, this is a qualification exercise. The student is responsible for a reading list comprised of 60 texts, (the definition of what constitutes a standard text is internal to the design of the lists) selected from standard department reading lists; 30% of the list may be altered to suit particular interests. Students are assessed on a pass/fail basis on the following:

1. The student will write a three hour examination composed of four questions, from which the student chooses two. These questions give the student an opportunity to demonstrate the range and depth of their reading. The questions will ask the student to place a range of primary texts in relation to key critical debates in the field.

2. This written examination is followed one week later by a one hour oral examination on questions arising from both elements of the written work.

Primary Area Qualification (Year 2)

After the completion of the SAQ, the student progresses to his or her Primary Area Qualification. The objective here is to develop sufficient expertise in a field of scholarly enquiry to be able to make original contributions to that field through the writing of a doctoral dissertation. Through discussion with his or her advisory committee, the student develops a reading list of approximately 120 works divided roughly into two parts. The first comprises a Field Survey that is aimed at sketching the broad contours of an area of scholarly enquiry. The second is a more specific articulation of the works, called the Topic Readings, that will immediately impinge on the dissertation. The PAQ Examination, intended to determine whether the student is prepared to write and capable of writing the PhD thesis, is usually taken 12 months after the completion of the SAQ:

1. A three-hour examination on the primary material to be studied in the thesis and on scholarship concerning that primary material-i.e. this is directed specifically to the Topic Readings. The student will be asked to answer two questions from a choice of three.

2. A three-hour examination on the immediate background--the literary, cultural and intellectual milieu of the subject being studied-i.e. this is directed specifically at the Field Survey. The student will be asked to answer two questions from a choice of three.

3. A two hour oral examination in which the examining committee usually follows up on material in the written examinations and questions the student on plans for the doctoral thesis. While the examination is likely to focus on the student’s main area of interest, examiners also have the lee-way to ask questions pertaining to the overall list of texts.

Students are assessed on a pass/fail basis.

Dissertation Prospectus

Immediately following the Primary Area Qualification, the student develops, in consultation with his or her advisory committee, a full prospectus for their dissertation. The prospectus states the overall objective of the thesis, lays out the chapter structure, and summarizes the issues and concerns to be addressed in each chapter. If and when the Dissertation Committee ratifies the Prospectus, it is forwarded to the Graduate Studies 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>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL*6002</td>
<td>Topics in the History of Criticism</td>
<td>[0.50]</td>
</tr>
<tr>
<td>ENGL*6003</td>
<td>Problems of Literary Analysis</td>
<td>[0.50]</td>
</tr>
<tr>
<td>ENGL*6201</td>
<td>Topics in Canadian Literature</td>
<td>[0.50]</td>
</tr>
<tr>
<td>ENGL*6209</td>
<td>Topics in Colonial, Postcolonial and Diasporic Literature</td>
<td>[0.50]</td>
</tr>
<tr>
<td>ENGL*6412</td>
<td>Topics in Medieval/Renaissance Literature</td>
<td>[0.50]</td>
</tr>
<tr>
<td>ENGL*6421</td>
<td>Topics in Eighteenth Century and Romantic Literature</td>
<td>[0.50]</td>
</tr>
<tr>
<td>ENGL*6431</td>
<td>Topics in Nineteenth Century Literature</td>
<td>[0.50]</td>
</tr>
<tr>
<td>ENGL*6441</td>
<td>Topics in Modern British Literature</td>
<td>[0.50]</td>
</tr>
<tr>
<td>ENGL*6451</td>
<td>Topics in American Literature</td>
<td>[0.50]</td>
</tr>
<tr>
<td>ENGL*6611</td>
<td>Topics in Women’s Writing</td>
<td>[0.50]</td>
</tr>
<tr>
<td>ENGL*6621</td>
<td>Topics in Children’s Literature</td>
<td>[0.50]</td>
</tr>
<tr>
<td>ENGL*6641</td>
<td>Topics in Scottish Literature</td>
<td>[0.50]</td>
</tr>
<tr>
<td>ENGL*6691</td>
<td>Interdisciplinary Studies</td>
<td>[0.50]</td>
</tr>
<tr>
<td>ENGL*6811</td>
<td>Special Topics in English</td>
<td>[0.50]</td>
</tr>
<tr>
<td>ENGL*6801</td>
<td>Reading Course I</td>
<td>[0.50]</td>
</tr>
<tr>
<td>ENGL*6802</td>
<td>Reading Course II</td>
<td>[0.50]</td>
</tr>
</tbody>
</table>

May 13, 2014

2012-2013 Graduate Calendar
Management

The objective of the PhD in Management is to prepare individuals who already have a strong background in a management area such as marketing, organizational behaviour, leadership, hospitality / tourism, quality management, economics, finance, or human resources to be academic scholars. This program prepares individuals with solid, formal foundations in theory and practice.

The PhD in Management is a thesis-based program that is offered through the College of Management and Economics. The participating academic units are the Department of Marketing and Consumer Studies (MCS), the School of Hospitality and Tourism Management (HTM), and the Department of Business (DoB). The PhD in Management has three fields:

1. Marketing and Consumer Behaviour
2. Services Management
3. Organizational Leadership

which are offered jointly by the three academic units.

Administrative Staff

Associate Dean, Research and Graduate Studies
Sylvain Charlebois (900 MACK, Ext. 56808)
sylvain.charlebois@uoguelph.ca

Graduate Coordinator
Paul M. Anglin (213F Macdonald Institute, Ext. 58542)
panglin@uoguelph.ca

Graduate Secretary
Cori Wells (205A Macdonald Institute, Ext. 52725)
cori.wells@uoguelph.ca

Graduate Faculty

From the Department of Marketing and Consumer Studies

Paul M. Anglin
BSc Toronto, MA, PhD Western Ontario - Associate Professor

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

Sylvain Charlebois
BComm, MBA, DBA (Marketing) Sherbrooke - Professor and Associate Dean, Research and Graduate Studies, College of Management and Economics

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

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

Karen A. Finlay
BA Western Ontario, MBA, PhD Toronto - Professor

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

Vinay Kanetkar
BArch Indian Inst. of Tech, MArch, MSc, PhD British Columbia - Associate Professor and Chair

Jane Londerville
MBA Harvard - Associate Professor

Tanya Mark
BA, PhD Western Ontario - Assistant Professor

Breant McKenzie
BA, McMaster, MBA Dalhousie, PhD Griffith - Associate Professor

Paulette S. Padanyi
BA Florida Presbyterian College, MBA Florida, PhD York - Associate Professor

Lefa Teng
BEng Jiangsu, MSc Beijing, PhD Concordia - Associate Professor

Anne Wilcock
BASc Guelph, MSc, PhD Purdue - Professor

Sunghwan Yi
BBA, MBA Korea, PhD Penn State - Associate Professor

Jian Zhou
BA, MA Renmin (China), PhD Illinois (Chicago) - Assistant Professor

From the School of Hospitality and Tourism Management

Joe Barth
BSc Guelph, MBA Wilfrid Laurier, MPS, PhD Cornell - Associate Professor

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

Statia Elliott

Graduate Faculty

From the Department of Business

Ron Baker
BComm, Sudbury, MBA Athabasca, PhD Birmingham UK - Associate Professor

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

Francesco Braga
DOTT Milan, PhD Guelph - Associate Professor

Nita Chhinzer
BA York, MBA, PhD McMaster - Assistant Professor

Julia Christensen Hughes
BComm Guelph, MBA, PhD York - Professor and Dean, College of Management and Economics

Michael Cox
CD Naval Officer Program, MA Western Washington, PhD Union (Ohio), MCIM Chartered Institute of Marketing Management - Associate Professor

Elliott Currie
BA, MBA McMaster, CMA - Associate Professor

Rumina Dhall
MBA, PhD York - Assistant Professor

Jamie A. Gruman
BA Concordia, MA Lakehead, PhD Windsor - Associate Professor

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

Sean Lyons
BPA Windsor, MA, PhD Ottawa - Associate Professor

Sara Mann
BComm, MBA McMaster, PhD Toronto - Associate Professor

Fred Pries
BMath Waterloo, MASc, PhD Waterloo, CA - Associate Professor

Ken Smith
BSc York, MBA, MSc, PhD Toronto - Assistant Professor

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

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

Agnes Zdaniuk
BA, MSc, PhD Waterloo - Assistant Professor

PhD Program

Admission Requirements

All graduate programs must conform to the Faculty of Graduate Studies policy on admissions. Accordingly, there will be three means of entry to the three-field PhD in Management:

1. An applicant who holds a recognized master’s degree in a management field with an average standing of at least “B+” may be admitted to PhD studies as a regular or provisional student

2. An applicant who holds a recognized master’s degree with high standing in a field other than management and who wishes to proceed to doctoral study in a management field should consult with the graduate coordinator about eligibility.

3. An applicant who has achieved excellent standing at the honours baccalaureate level in a management field and who wishes to proceed to doctoral study may enroll in a related Masters degree. If the student achieves a superior academic record and shows a particular aptitude for research, the Board of Graduate Studies, on the recommendation of the Department/School admissions committee, may authorize transfer to the PhD program without requiring the student to complete the master’s degree.
All applicants are required to submit GRE (Graduate Records Exam) or GMAT (Graduate Management Admission Test).

**Degree Requirements**

The goal of the PhD program in Management is to produce graduates with both a breadth of knowledge about management theories in general, and a depth of knowledge such that they will be competent researchers and/or teachers in their chosen field. Since most courses will be common to the current three fields in this program as well as to any future fields, the key indicator of the student’s area of specialization will be his or her thesis topic. Students should select all courses in consultation with the graduate coordinator and their supervisor.

Five core courses 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 and, two courses cover quantitative and qualitative research methodologies. The fifth course is a seminar series that introduces students to the diversity of research projects undertaken by Guelph faculty, graduate students and by visitors to the University. Students will select two additional courses in their area of specialization in consultation with their thesis supervisor and the program coordinator. The core courses will encourage interaction and knowledge-sharing among all of the PhD in Management. 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 not later than the end of the fourth semester after completion of the qualifying examination.

Overall, the proposed program consists of two semesters of coursework (five core courses and two electives), 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 3.0 credits (6 courses) and a research seminar (0.0 credit) over two semesters.

### Year 1

**Semester 1**

- MCS*6950 [0.00] Marketing & Consumer Studies Seminar
- MGMT*6800 [0.50] Philosophy of Social Science Research
- MGMT*6820 [0.50] Theory of Management
- elective - (0.50)

**Semester 2**

- MCS*6950 [0.00] Marketing & Consumer Studies Seminar
- One course in quantitative methods
- One course in qualitative methods
- elective - (0.50)

**Year 2**

**Semester 3**

Qualifying Examination

**Semester 4**

Qualifying Examination

**Year 3**

Thesis Research and Defense

### Courses

#### Required Courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>MGMT*6800</td>
<td>Philosophy of Social Science Research [0.50]</td>
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</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>MGMT*6820</td>
<td>Theory of Management [0.50]</td>
</tr>
</tbody>
</table>

This course examines the evolution of management thought and the overarching theories that have been successfully applied to multiple functional areas of the organization. Examples of theories that apply to such disparate areas as operations, marketing, and organizational behaviour include agency theory, transaction cost analysis, and contingency theory.

- MCS*6950 [0.00] Marketing & Consumer Studies Seminar

### Electives

- BUS*6800 [0.50] Readings in Leadership I
- BUS*6810 [0.50] Readings in Leadership II
- BUS*6820 [0.50] Readings in Management
- HTM*6220 [0.50] Special Topics in Management Issues
- MCS*6000 [0.50] Consumption Behaviour Theory I
- MCS*6010 [0.50] Consumption Behaviour Theory II
- MCS*6070 [0.50] Introduction to Structural Equation Modeling
- MCS*6100 [0.50] Marketing Theory
- MCS*6120 [0.50] Marketing Management

### Note

As per UG norms, other electives from other UG academic units can be considered if agreed to by the graduate coordinator.
Marketing and Consumer Studies

Faculty and graduate students in the Department of Marketing and Consumer Studies share a focus on the multi-disciplinary examination of consumer behaviour and marketplace phenomena. Central to the department’s research and graduate teaching program is the application of consumer behaviour and marketplace knowledge to marketing, housing and real estate management, quality management, and policy issues of concern to a wide variety of private, public and nonprofit sector organizations. The department’s graduate program leads to the master of science degree in marketing and consumer studies.

Administrative Staff

Chair
Vinay Kanetkar (203 Macdonald Institute, Ext. 52221) vkanetka@uoguelph.ca

Graduate Coordinator
Paul Anglin (213F Macdonald Institute, Ext. 58542) panglin@uoguelph.ca

Graduate Secretary
Cori Wells (205A Macdonald Institute, Ext. 52725) cori.wells@uoguelph.ca

Graduate Faculty

Paul M. Anglin
BSc Toronto, MA PhD Western Ontario - Associate Professor

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

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BComm, MBA, DBA (Marketing) Sherbrooke - Professor and Associate Dean, Research and Graduate Studies, College of Management and Economics

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BPHE Toronto, MA Queen’s, PhD British Columbia - Associate Professor

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

Vinay Kanetkar
BEng Indian Inst. of Tech, MArch, MSc, PhD British Columbia - Associate Professor and Chair

Jane Londereville
MBA Harvard - Associate Professor

Tanya Mark
BA, PhD Western Ontario - Assistant Professor

Brent McKenzie
BA, McMaster, MBA Dalhousie, PhD Griffith - Associate Professor

Paulette S. Padanyi
BA Florida Presbyterian College, MBA Florida, PhD York - Associate Professor

Lefa Teng
BEng Jiangsu, MSc Beijing, PhD Concordia - Associate Professor

Anne Wilcock
BA/BSc Guelph, MSc, PhD Purdue - 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 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 coordinator and/or his/her advisory committee and is normally chosen to provide theoretical, conceptual, and/or methodological background for the thesis. Each student is also required to attend the department’s graduate seminar for the duration of his or her program.

A significant number of graduate students in marketing and consumer studies direct their course work and thesis research toward applications related to marketing within private, public, and non-profit sector organizations. This particular focus is especially appropriate for students with undergraduate preparation in business administration, commerce, economics, or marketing who have career interests in research and analysis in marketing management. The program also provides excellent training toward the pursuit of a PhD in marketing or consumer behaviour or a related business discipline.

Departmental Core Courses

The departmental core is required of all graduate students in the Department of Marketing and Consumer Studies. It contains a minimum of 6 half credits (3.0 full credits) in total, and enrolment in the marketing and consumer studies department seminar (MCS*6950) for each semester of full-time graduate study. The program consists of:

**Fall Semester:**
- MCS*6600 [0.50] Consumption Behaviour Theory I
- MCS*6650 [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*6600 [0.50] Multivariate Research Methods
- MCS*6680 [0.50] Qualitative Research Methods
- MCS*6950 [0.00] Marketing & Consumer Studies Seminar

* 1 of the following restricted electives

**Electives**
- MCS*6010 [0.50] Consumption Behaviour Theory II
- MCS*6120 [0.50] Marketing Management

**Note**

*Chosen by the graduate student with the approval of the graduate coordinator and his/her advisory committee.

**Admission Requirements**

Admission information should be requested directly from the graduate secretary 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 deadline for apply for September admission to the master of science program is April 1. The Department of Marketing and Consumer Studies admits students to the graduate program only in September.

**Degree Requirements**

The program normally consists of at least 6 half credit (3.0 full credits) graduate 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 his/her intended area of study and thesis research.

**Graduate Diploma in Market Research**

The Graduate Diploma in Market Research serves two purposes:

1. It meets 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.
2. It serves as an early exit point for participants in the MSc in Marketing and Consumer Studies program. The Department periodically enrolls students in its MSc program who do well in their coursework but decide not to complete their thesis research.

**Admission Requirements - Transfer from MSc Program**

Students who wish to exit early from the MSc in Marketing and Consumer Studies program and receive the Graduate Diploma in Market Research will apply to the Department’s Graduate Admissions Committee for admission into the Diploma program. The Committee will make their decision based on reviewing the applicant’s grades and performance in the MSc in Marketing and Consumer Studies program and discussing his or her potential as a market research practitioner with the Department’s graduate faculty.
Admission Requirements – Direct Entry

Students who wish to enter directly into the Graduate Diploma in Market Research program will apply to the Department’s Graduate Admissions Committee through the normal University application process. The Committee will make their decision on essentially the same bases as they do for the MSc program (applicant’s undergraduate background, undergraduate grades, and GRE or GMAT scores). However, in lieu of the research interests discussion paper required of MSc applicants, Graduate Diploma applicants will submit a discussion paper indicating why they are interested in the market research field. Other than the orientation of the discussion paper, the admission requirements for the Graduate Diploma in Market Research will be the same as those for the MSc in Marketing and Consumer Studies program. This will ensure that students who enter directly into the Graduate Diploma program can consider switching into the MSc program.

Thus, candidates for both the proposed Graduate Diploma and for the already-existing MSc will generally 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 have acceptable GRE or GMAT scores.

Alternatively, they may be exceptional applicants, such as those with considerable experience in a business or management role, who meet the minimum grade requirements but are lacking in the required academic areas. If so, their full acceptance into the program may be conditional upon successfully completing one or more recommended undergraduate courses in order to comply with program standards.

As the Chair of the Department’s Graduate Admissions Committee, the Graduate Coordinator will be responsible for notifying Graduate Studies of the Committee’s admission decisions. The Graduate Coordinator will also act as the primary advisor for all direct entry Diploma students until they either graduate or switch into the MSc program.

Degree Requirements

Students who are awarded the Graduate Diploma in Market Research will have taken courses for at least two semesters. To qualify for the Graduate Diploma, students will have successfully completed the following five courses, plus they will have regularly attended the Department’s 0.0 credit pass/fail weekly seminar class (MCS*6950) during both semesters:

<table>
<thead>
<tr>
<th>Fall Semester:</th>
<th>Winter Semester:</th>
</tr>
</thead>
<tbody>
<tr>
<td>MCS*6000 [0.50]</td>
<td>MSc*6080 [0.50]</td>
</tr>
<tr>
<td>MCS*6050 [0.50]</td>
<td>MSc*6060 [0.50]</td>
</tr>
<tr>
<td>MCS*6100 [0.50]</td>
<td>MSc*6950 [0.00]</td>
</tr>
<tr>
<td>MCS*6950 [0.00]</td>
<td>Marketing &amp; Consumer Studies Seminar</td>
</tr>
</tbody>
</table>

Courses

For courses without a semester designation the student should consult the graduate coordinator.

MSc*6000 Consumption Behaviour Theory I [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.

Prerequisite(s): None

MSc*6010 Consumer 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): MSc*6000 or consent of instructor

MSc*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.

Prerequisite(s): MSc*6050 or consent of instructor

MSc*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): MSc*6050 or consent of instructor

IX. Graduate Programs, 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 and applied statistics, including the interface between the two. 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
David Kribs (438 MacNaughton, Ext. 56556/52155)
dkribs@uoguelph.ca

Graduate Coordinator
Rajesh Pereira (519 MacNaughton, Ext. 53552)
pereirar@uoguelph.ca

Graduate Secretary
Susan McCormick (440 MacNaughton, Ext. 56553/52155)
smcorm@uoguelph.ca

Graduate Faculty

R. Ayesha Ali
BSc Western Ontario, MSc Toronto, PhD Washington - Assistant Professor

Daniel A. Ashlock
BSc Kansas, PhD California Institute of Technology - Professor

Chris Bauch
BSc Texas, PhD Warwick - Associate Professor

Edward M. Carter
BSc, MSc, PhD Toronto - Professor

Monica Cojocaru
BA, MSc Bucharest, PhD Queen's - Associate Professor

Gerarda Darlington
BSc, MSc Guelph, PhD Waterloo - Professor

Robert Deardon
BSc Exeter, MSc Southampton, PhD Reading - Associate Professor

Anthony F. Desmond
BSc, MSc National University of Ireland (U.C.C.), PhD Waterloo - Professor

Hermann J. Eberl
Dipl. Math (MSc), PhD Munich Univ. of Tech. - Professor

Zeny Feng
BSc York, MA, PhD Waterloo - Assistant Professor

Marcus R. Garvie
MS Sussex, MS Wales, MS Reading, PhD Durham - Assistant Professor

Stephen Gismondi
BSc, MSc, PhD Guelph - Associate Professor

Julie Horrocks
BSc Mount Allison, BFA Nova Scotia College of Art & Design, MMath, PhD Waterloo - Associate Professor

Peter T. Kim
BA Toronto, MA Southern California, PhD California (San Diego) - Professor

David Kribs
BSc Western, MMath, PhD Waterloo - Professor and Chair

Herb Kunze
BA, MA, PhD Waterloo - Professor

Anna T. Lawniczak
MSc Wroclaw, PhD Southern Illinois - Professor

Paul McNicholas
BA, MA, MSc, PhD Dublin (Ireland) - Associate Professor and University Research Chair

Rajesh Pereira
BSc, MSc McGill, PhD Toronto - Associate Professor

Radhey S. Singh
BA, MA Banaras, MS, PhD Michigan State - Professor

Gary J. Umphrey
BSc, MSc Guelph, PhD Carleton - Associate Professor

Allan William
BMath, MMath Waterloo, PhD Cornell - Associate Professor

Bei Zeng
BSc, MSc Tsinghua, PhD M.I.T. - Assistant Professor

MSc Program

The department offers an MSc degree with several options. Students choose between either mathematics or statistics fields and complete their program either by thesis or project. The two main program types are regular and interdisciplinary. Interdisciplinary programs involve faculty members of this and other university departments and focus on problems of common interest to both departments. Examples include joint studies in quantitative genetics involving faculty in the Department of Animal and Poultry Science; studies of economic management of renewable resources involving faculty from the economics departments; modeling of physiological processes involving faculty from the Ontario Veterinary College or the College of Biological Science; toxicological modeling or risk assessment in collaboration with faculty involved in the Toxicology Research Centre.

Admission Requirements

For the MSc Degree Program, applicants will normally have either

1. an honours degree with an equivalent to a major in the intended area of emphasis.
   or
2. 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 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.

Degree Requirements

For both regular and interdisciplinary programs, the degree requirements may be met by taking either:

- an MSc by thesis which requires at least 2.0 credits (four courses) plus a thesis; or
- an MSc without thesis (by project) which requires at least six courses; i.e., 3.0 credits, 2.0 of which must be for graduate-level courses plus successful completion within two semesters;

One of:

- MATH*6998 [1.00] MSc Project in Mathematics
- STAT*6998 [1.00] MSc Project in Statistics

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 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.

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

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] Statistical Inference
- STAT*6860 [0.50] Linear Statistical Models

It is required that students take the undergraduate course Statistical Inference, STAT*4340, if this course or its equivalent has not previously been taken.

Interdisciplinary Programs

1. The general course requirements, above, must be met.

2. The project or thesis of an interdisciplinary program must directly integrate the study of mathematics or statistics with another discipline.

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 Studies Committee will consider applications for direct entry to PhD and for transfer from MSc to PhD. In any event, a member of the department's graduate faculty must agree to act as an advisor to the student.
Degree Requirements
The PhD degree is primarily a research degree. For that reason, course work commonly comprises a smaller proportion of the student's effort than in the master's program. Course requirements are as follows:

Applied Mathematics
Students must successfully complete 2.0 Graduate course credits; i.e. four graduate courses. At least three of these courses must be graduate level MATH courses. Depending upon the student's academic background, further courses may be prescribed. All courses are chosen in consultation with the advisory committee. Additional courses may be required at the discretion of the advisory committee and/or the departmental graduate committee. With departmental approval, some courses given by other universities may be taken for credit.

Applied Statistics
Students must successfully complete 2.0 Graduate course credits. Depending upon the student's academic background, further courses may be prescribed. Students must take the following courses as part of the four required courses (providing that these courses were not taken as part of the student's master's degree program):

- STAT*6801 [0.50] Statistical Learning
- STAT*6841 [0.50] 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 committee. With departmental approval, some courses given by other universities may be taken for credit.

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 GDip/MBinf/MSc Programs
The Department of Mathematics and Statistics participates in the GDip, MBinf and MSc programs in Bioinformatics. Please consult the Bioinformatics listing for a detailed description of these graduate programs and a list of the graduate faculty involved.

Courses

Mathematics

- MATH*6011 Dynamical Systems I U [0.50]
  Basic theorems on existence, uniqueness and differentiability; phase space, flows, dynamical systems; review of linear systems, Floquet theory; Hopf bifurcation; perturbation theory and structural stability; differential equations on manifolds. Applications drawn from the biological, physical, and social sciences.

- 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.

- 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.

- 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.

- MATH*6031 Functional Analysis U [0.50]
  Review of metric, normed, and inner product spaces; Banach contraction principle; brief introduction to measure and integration; elementary Fourier analysis; adjoint and compact operators; nonlinear operators and the Frechet derivative; Baire category theorem; principle of uniform boundedness; open mapping theorem; principle of uniform boundedness: closed graph theorem.

- 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.

- 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.

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.

- 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.

- MATH*6091 Topics in Analysis U [0.50]
  Selected topics from topology, real analysis, complex analysis, and functional analysis.

- 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.

- 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.

- 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.

- MATH*6410 Numerical Analysis II U [0.50]
  One or more topics selected from those discussed in Numerical Analysis I, but in greater depth.

- MATH*6990 Mathematics Seminar U [0.00]
  Students will review mathematical literature and present a published paper.

- MATH*6998 MSc Project in Mathematics U [1.00]
  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.

- STAT*6098 Graduate Diploma Project in Applied Statistics U [0.50]
  This project leading to a technical report, which utilizes statistical principles and procedures in the solution of a substantive research problem. Completion of this course requires a formal presentation of the project to faculty and students.

- 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.

- STAT*6700 Stochastic Processes U [0.50]
  The content of this course is to introduce Brownian motion leading to the development of stochastic integrals thus providing a stochastic calculus. The content of this course will be delivered using concepts from measure theory and so familiarity with measures, measurable spaces, etc., will be assumed.

- 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.

- STAT*6741 Statistical Analysis for Reliability and Life Testing U [0.50]
  Statistical failure models, order statistics, point and interval estimation procedures for life time distributions, testing reliability hypotheses, Bayes methods in reliability, system reliability.

- 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.
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.

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.

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.

STAT*6841 Statistical Inference U [0.50]
Bayesian and likelihood methods, large sample theory, nuisance parameters, profile, conditional and marginal likelihoods, EM algorithms and other optimization methods, estimating functions, MonteCarlo methods for exploring posterior distributions and likelihoods, data augmentation, importance sampling and MCMC methods.

STAT*6850 Advanced Biometry U [0.50]
Topics on advanced techniques for analyzing data from biological systems. In particular, univariate discrete models, stochastic processes as it relates to population dynamics and growth models with time dependencies, generalized discrete models for spatial patterns in wildlife, the theoretical foundation and recent results in aquatic bioassays, and other topics relating to the student's research interest.

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.

STAT*6870 Experimental Design U [0.50]
This is an advanced course in experimental design which emphasizes proofs of some of the fundamental results in the topic. The topics will include: design principles; design linear models; designs with several factors; confounding in symmetrical factorials; fractional factorials.

STAT*6880 Sampling Theory U [0.50]
Theory of equal and unequal probability sampling. Topics in: simple random, systematic, and stratified sampling; ratio and regression estimates; cluster sampling and subsampling; double sampling procedure and repetitive surveys; nonsampling errors.

STAT*6920 Topics in Statistics U [0.50]

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.

STAT*6960 Design of Experiments and Data Analysis for the Life Sciences W [0.50]
Principles of design; randomized complete block; latin square and extensions the split plot and extension; incomplete block designs; confounding and fractional replication of factorial arrangements; response surfaces the analysis of series of experiments; the general linear model; multiple regression and data analytic techniques. 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.

STAT*6970 Statistical Consulting Internship U [0.25]
This course provides experience in statistical consulting in a laboratory and seminar environment. The student will participate in providing statistical advice and/or statistical analyses and participate in seminar discussions of problems arising from research projects in various disciplines.

STAT*6990 Statistics Seminars by Graduate Students U [0.00]

STAT*6998 MSc Project in Statistics U [1.00]
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. 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. The areas of emphasis and the faculty associated with those areas are:

- Biochemistry (BCH)
- Cell Biology (CEB)
- Microbiology (MICR)
- Molecular Biology and Genetics (MBG)
- Plant Biology (PBIO)

Faculty in Molecular and Cellular Biology also participate in the interdepartmental programs in Bioinformatics, Biophysics and the collaborative programs in Neuroscience and Toxicology.

Administrative Staff

Chair
Chris Whitfield (4477 Science Complex, Ext. 53362)
mcbchair@uoguelph.ca

Graduate Coordinator
Janet Wood (4251 Science Complex, Ext. 53866)
jwood@uoguelph.ca

CBS Graduate Secretary
Carol V. Schlacht (3481 Science Complex, Ext. 53815)
cbsmcbgrad@uoguelph.ca

CBS Graduate Admissions Secretary
Karen White (3479 Science Complex, Ext. 52730)
cbsgrad@uoguelph.ca

Graduate Faculty

Emma Allen-Vercue
BSc London UK, PhD Open UK - Assistant Professor

Jnanankur Bag
BSc, MSc, PhD Calcutta - Professor

Mark D. Baker
BSc Laurentian, MSc, PhD Waterloo - Professor

Andrew J. Bendall
BSc, MSc Australian National, PhD Macquarie - Associate Professor

Manfred Brauer
BSc, MSc, PhD Wisconsin - Associate Professor

Anthony L. Clarke
BSc, MSc, PhD Waterloo - Professor

Joseph L. Colasanti
BSc, PhD Western Ontario - Associate Professor

Marc Coppolino
BSc Waterloo, MSc, PhD Toronto - Associate Professor

John Dawson
BSc Wilfrid Laurier, PhD Alberta - Associate Professor

Michael J. Emes
BSc, PhD Sheffield - Professor and Dean of the College of Biological Science

Steffen P. Graether
BSc, MSc, PhD Queen’s - Assistant Professor

John S. Greenwood
BSc, MSc McMaster, PhD Calgary - Associate Professor

George Harauz
BASc, MSc, PhD Toronto - Professor

Nina Jones
BSc Guelph, PhD Toronto - Associate Professor

David Josephy
BSc Toronto, PhD British Columbia - Professor

Azad Kazshik
BVSc, MSc Haryana, DSc Inst. Pasture - Associate Professor

Cezar Khursigara
BVSc Ryerson, PhD McGill - Assistant Professor

Matthew S. Kimber
BSc, PhD Toronto - Associate Professor

Peter J. Krell
BSc, MSc Carleton, PhD Dalhousie - Professor

Joseph S.L. Lam
BSc, PhD Calgary - Professor

Reggie Y.C. Lo
BSc, PhD Alberta - Professor

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

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

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

Rod Merrill
BSc Lethbridge, PhD Ottawa - Professor

Richard D. Mosser
BSc, PhD Waterloo - Associate Professor

Robert T. Mullen
BSc, PhD Alberta - Professor

Lucy M. Mutharia
BSc, MSc Nairobi, PhD British Columbia - Associate Professor

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

Ross N. Nazar
BSc, PhD Toronto - Professor

E. Jane Robb
BSc York, PhD British Columbia - Professor

Steven Rothstein
BA Swarthmore College, PhD Wisconsin - Professor

Stephen Y.K. Seah
BSc, MSc National University of Singapore, PhD Sheffield - Associate Professor

Frances Sharom
BSc Guelph, PhD Western Ontario - Professor

Roselynn M.W. Stevenson
BSc, PhD Manitoba - Professor

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

George van der Merve
BSc, MSc Stellenbosch (South Africa) - Associate Professor

Terry Van Raay
BSc Windsor, MSc Guelph, PhD Utah - Assistant Professor

Christopher Whitfield
BSc Newcastle, PhD Edinburgh - Professor and Chair

Janet M. Wood
BSc Victoria, PhD Edinburgh - Professor and Graduate Coordinator

Krassimir (Joseph) Yankulov
BSc Sophia, PhD ICRF London - Associate Professor

MSc Program

The objective of the MCB MSc 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 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.

Applicants must obtain the support of a faculty member willing to serve as their thesis advisor.

Applications for the program will be considered at any time and admission may be granted for entry in January, May or September. The College of Biological Science requests that all components of the application for graduate school including transcript(s), graduate certificate(s), grading scale(s), language test, reference letters, statement of interest and name of faculty advisor be received within two months of submission through the OUAC portal. Applications that are incomplete after this time period will be closed.
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, you are strongly encouraged to view the "Before von Apply" and "Admission Process" webpages on the ADR Future Student's site. NOTE: The name of a potential advisor(s) is required in order to complete the submission summary.

On-line applications, required documents and instructions may also be found on the Office of Graduate Studies webpage or in the Graduate Calendar

Completed applications should be submitted to the CBS Graduate Admissions Secretary.

**Degree Requirements**

Students in the MSc program must complete a minimum of 3 courses (1.5 credits) at the graduate level. Courses MCB*6100 MSc Research Topics in Molecular & Cellular Biology (0.5) and MCB*6200 MSc Scientific Communication in Molecular & Cellular Biology (0.5) are mandatory. Normally these two courses must be completed in the first year of study. 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 objective of the MCB PhD 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 courses MCB*6100 (Research Topics in Molecular and Cellular Biology) and MCB*6200 (Scientific Communication 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%). Applicants must obtain the support of a faculty member willing to serve as their thesis advisor.

The College of Biological Science requests that all components of the application for graduate school including transcript(s), graduate certificate(s), grading scale(s), language test, reference letters, statement of interest and name of faculty advisor be received within two months of submission through the OUAC portal. Applications that are incomplete after this time period will be closed.

Applications for the program will be considered at any time and admission may be granted for entry in January, May or September.

**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, you are strongly encouraged to view the "Before von Apply" and "Admission Process" webpages on the ADR Future Student's site. NOTE: The name of a potential advisor(s) is required in order to complete the submission summary.

On-line applications, required documents and instructions may also be found on the Office of Graduate Studies webpage or in the Graduate Calendar.

Completed applications should be submitted to the CBS Graduate Admissions Secretary.

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**Courses**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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</thead>
<tbody>
<tr>
<td>MCB*6100</td>
<td>MSc Research Topics in Molecular and Cellular Biology U [0.50]</td>
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<tr>
<td>MCB*6200</td>
<td>MSc Scientific Communication in Molecular and Cell Biology U [0.50]</td>
</tr>
<tr>
<td>MCB*6310</td>
<td>Advanced Topics in Developmental and Cellular Biology U [0.50]</td>
</tr>
<tr>
<td>MCB*6320</td>
<td>Advanced Topics in Microbiology U [0.50]</td>
</tr>
<tr>
<td>MCB*6330</td>
<td>Molecular Biology of Viruses U [0.50]</td>
</tr>
<tr>
<td>MCB*6340</td>
<td>Advanced Topics in Molecular Genetics U [0.50]</td>
</tr>
<tr>
<td>MCB*6350</td>
<td>Advanced Topics in Plant Biology U [0.50]</td>
</tr>
<tr>
<td>MCB*6360</td>
<td>Advanced Topics in Biochemistry and Molecular Biology U [0.50]</td>
</tr>
<tr>
<td>MCB*6370</td>
<td>Protein Structural Biology and Bioinformatics U [0.50]</td>
</tr>
</tbody>
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**Degree Requirements**

Students in the PhD program must complete two mandatory graduate level courses MCB*7100 PhD Research Topics in Molecular & Cellular Biology (0.50 credit) and MCB*7200 PhD Scientific Communication in Molecular & Cellular Biology (0.50 credit).

Normally, these two courses must be completed in the first year of study. Students without an MSc degree in Molecular and Cellular Biology or the equivalent are required to take one additional graduate course. Other courses may be taken on the recommendation of the Advisory Committee. An average of “B-minus” (70%) must be achieved in the prescribed courses. To be a candidate for the PhD degree, each student must pass a PhD Qualifying Exam. The Qualifying Examination is completed before the end of the fifth semester (for students with an MSc) or the end of the seventh semester (for students without an MSc).

The PhD thesis research must involve original enquiry into a well-defined question in the molecular biosciences. It is expected to result in the publication of one or more papers in high-quality peer-reviewed journals. The research must represent a significant contribution to the relevant research field.

All students beyond year 1 in the program are required to participate annually in the CBS Graduate Student Symposium by presenting a poster or giving a short talk describing their research progress.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MCB*6380</td>
<td>Structure and Function of Biological Membranes U [0.50]</td>
<td>[0.50]</td>
<td>This course covers multidisciplinary investigations of the basic structure and function of membranes in relation to cell biology. Topics will include structural biology of membrane proteins, experimental approaches for studying membranes, membrane transport systems, import-export systems and/or membrane trafficking.</td>
</tr>
<tr>
<td>MCB*7100</td>
<td>PhD Research Topics in Molecular and Cellular Biology U [0.50]</td>
<td>[0.50]</td>
<td>The development and refinement of the skills of scientific communication, emphasizing writing skills, in the context of developing a thesis proposal. This course is mandatory for all students in the MCB PhD program and is normally completed within the first two (2) semesters of the program, and must be taken with the accompanying course MCB*7200.</td>
</tr>
<tr>
<td>MCB*7200</td>
<td>PhD Scientific Communication in Molecular and Cell Biology U [0.50]</td>
<td>[0.50]</td>
<td>The development and refinement of the skills of scientific communication emphasizing oral presentation. Students will present a public seminar on a contemporary subject in the molecular biosciences culminating in a description of the proposed research. This course is mandatory for all students in the MCB PhD program and must be taken with the accompanying course MCB*7100.</td>
</tr>
</tbody>
</table>
Neuroscience

The Collaborative Neuroscience program provides a specialization for MSc/MBS/PhD students engaged in research in the rapidly expanding field of neuroscience, by permitting students to combine their departmental degree program with multidisciplinary exposure to the field of neuroscience. This unique combination of multidisciplinary studies provides students with the best possible foundation for academic careers in neuroscience and related areas. The program includes participation from core faculty in the following departments: Animal and Poultry Science, Biomedical Science, Human Health and Nutritional Sciences, Integrative Biology, Molecular and Cellular Biology, Pathobiology, Population Medicine and Psychology.

Administrative Staff

Neil MacLusky
Director & Graduate Coordinator (OVCE 2633, Ext. 54700) nmclusk@uoguelph.ca

Wendy Arthur
Graduate Secretary (Biomedical Science, OVCE 2633, Ext. 54900) warthur@uoguelph.ca

Graduate Faculty

Craig D. Bailey
Assistant Professor, Biomedical Sciences

Andrew J. Bendall
Associate Professor, Molecular and Cellular Biology

Leah R. Bent
Associate Professor, Human Health and Nutritional Sciences

Nicholas J. Bernier
Professor, Integrative Biology

Elena Choleris
Professor, Psychology

Donald Dedrick
Associate Professor, Philosophy/Psychology

Mark J. Fenske
Associate Professor, Psychology

George Harauz
Professor and Canada Research Chair, Molecular and Cellular Biology

Andreas Hyland
Assistant Professor, Integrative Biology

Nina Jones
Associate Professor and Canada Research Chair, Molecular and Cellular Biology

Bettina E. Kalisch
Associate Professor, Biomedical Sciences

Frederic Laberge
Assistant Professor, Integrative Biology

Francesco Leri
Associate Professor, Psychology

Ray Lu
Associate Professor, Molecular and Cellular Biology

David W.L. Ma
Associate Professor, Human Health and Nutritional Science

Neil J. MacLusky
Professor and Chair, Biomedical Sciences

Georgia Mason
Professor and Canada Research Chair, Animal and Poultry Science

Robert L. McLaughlin
Associate Professor, Integrative Biology

Daniel V. Meegan
Associate Professor, Psychology

Lee Niel
Assistant Professor, Population Medicine

Linda A. Parker
Professor and Canada Research Chair, Psychology

John Z. Srbley
Assistant Professor, Human Health and Nutrition

Lana M. Trick
Associate Professor, Psychology

Patricia V. Turner
Professor, Pathobiology

Lori A. Vallis
Associate Professor, Human Health and Nutritional Sciences

Terry Van Raay
Assistant Professor, Molecular and Cellular Biology

MSc/MBS Program

The Collaborative MSc/MBS Program in Neuroscience enables students engaged in neuroscience research to combine their departmental degree program with a multidisciplinary specialization in the field of neuroscience.

Admission Requirements

MSc/MBS students in the Collaborative Program in Neuroscience must meet the admission requirements of the participating department in which they are enrolled. The application process has two stages: first, application to the primary program of interest, identifying interest in the Collaborative Program as a secondary focus. If the student is admitted to the primary program, the second stage is then admission to the Collaborative Program.

Degree Requirements

In addition to coursework in their respective departments, students in the MSc/MBS program must complete NEUR*6000 as well as registering for NEUR*6100 each term that they are in the program. In NEUR*6100, students and faculty will meet one a month to discuss issues/ hear talks/ present research in neuroscience.

PhD Program

The Collaborative PhD Program in Neuroscience enables students engaged in neuroscience dissertation research to combine their departmental degree program with a multidisciplinary specialization in the field of neuroscience.

Admission Requirements

PhD students in the Collaborative Program in Neuroscience must meet the PhD admission requirements for the participating department in which they are enrolled.

Degree Requirements

If a student enters the Collaborative PhD Program in Neuroscience at the doctoral level, in addition to coursework in their respective departments, students must complete NEUR*6000, or show evidence of course equivalence in prior training. Students must be engaged in neuroscience dissertation research. During each term of their program of studies, doctoral students must enroll in NEUR*6100. The seminar will meet monthly. Students must take their qualifying exams within five semesters of entering the program, as required by University graduate policies. One member on the qualifying exam committee must be a core member of the Collaborative Program in Neuroscience outside the student’s home department or a faculty member from another university approved by graduate studies, as required by University graduate policies. One member on the qualifying exam committee must be a core member of the neuroscience collaborative program outside the student’s home department or a faculty member from another university approved by graduate studies.

Courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>NEUR*6000</td>
<td>Principles of Neuroscience</td>
<td>0.50</td>
</tr>
<tr>
<td>NEUR*6100</td>
<td>Seminar in Neuroscience</td>
<td>0.00</td>
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</tbody>
</table>
Pathobiology

The Department of Pathobiology offers programs in Veterinary Pathology, Comparative Pathology, Veterinary Infectious Diseases, and Immunology.

The department offers programs of study leading to MSc and PhD degrees and a Graduate Diploma. The department also participates in the inter-departmental Doctor of Veterinary Science (DVSc) program.

Fields of Study

The Department of Pathobiology provides graduate programs in the following 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**
  - Anatomical pathology
  - Clinical pathology

Administrative Staff

Chair
Robert Jacobs (3839 Pathobiology, Ext. 54453)
rjacobs@ovc.uoguelph.ca

Graduate Coordinator
Jeff Caswell (3828 Pathobiology, Ext. 54555)
jcaswell@uoguelph.ca

Graduate Secretary - Admissions
Donna Kangas (3824 Pathobiology, Ext. 54725)
dkangas@uoguelph.ca

Secretary to the Chair
Elizabeth Gilbertson (3840 Pathobiology, Ext. 54649)
egilbert@uoguelph.ca

Administrative Assistant
Cathy Bernardi (3838 Pathobiology, Ext. 54750)
cbernard@uoguelph.ca

Graduate Faculty

John R. Barta
BSc, PhD Toronto - Professor

Dorothée Bienzle
DVM, MSc Guelph, PhD McMaster, Diplomate ACVP - Professor

Patrick Boerlin
DVM, PhD Bern - Associate Professor

Byram Bridle
BSc, MSc, PhD Guelph - Assistant Professor

Jeff Caswell
DVM, DVSc Guelph, PhD Saskatchewan, Diplomate ACVP - Professor and Graduate Coordinator

Robert A. Foster
BVSc (Hons) Queensland, PhD James Cook Univ. of North Queensland, MANZCVS, Diplomate ACVP - Professor

M. Anthony Hayes
BVSc Melbourne, PhD Saskatchewan, Diplomate ACVP - Professor

Robert M. Jacobs
BSc Toronto, DVM, PhD Guelph, Diplomate ACVP - Professor and Chair

Claire Jardine
BSc Guelph, MSc British Columbia, DVM, PhD Saskatchewan - Assistant Professor

Brandon N. Lifference
DVM, PhD Guelph, Diplomate ACVP - Assistant Professor

John S. Lumsden
BSc, DVM, MSc, PhD Guelph, Diplomate ACVP - Professor

Janet L. MacInnes
BSc Victoria, PhD Western Ontario - Professor

Bonnie A. Mallard
BSc, MSc, PhD Guelph - Professor

Eva Nagy
DVM, PhD, DSc Budapest - Professor

Andrew S. Pergrine
BVMS, PhD, DVM (Hons.) Glasgow, Diplomate EVPC, Diplomate ACVM - Associate Professor

Brandon L. Plattner
BSc, DVM Kansas State, PhD Iowa State, Diplomate ACVP - Assistant Professor

John F. Prescott
MA, VetMB, PhD Cambridge, FCAHS - Professor

Shayan Sharif
DVM Tehran, PhD Guelph - Professor

Dale A. Smith
DVM, DVSc Guelph - Professor

Patricia V. Turner
BVSc McMaster, MSc Dalhousie, DVM, DVSc Guelph, Diplomate CLAM, Diplomate ABT - Professor

J. Scott Weesø
DVM, DVSc Guelph, Diplomate ACVIM - Professor

R. Darren Wood
DVM Prince Edward Island, DVSc Guelph, Diplomate ACVP - Associate Professor

Geoffrey A. Wood
DVM Guelph, PhD Toronto, DVSc Guelph - Associate Professor

K. Sarah Wootton
BSc, PhD Guelph - Assistant Professor

MSc Program

The primary objective of the MSc program is to provide students with training in conceptual and laboratory aspects of research, combined with advanced training in a field of knowledge relating to manifestations, basic mechanisms and host resistance for diseases of vertebrates.

Admission Requirements

Applicants should have either a) an honours degree in biological sciences with at least a 'B' average during the final 2 years of the program, or a DVM (or equivalent) degree with at least a 'B' average over the four years of the program. In either case, performance in relevant biomedical science courses, (e.g. microbiology, immunology, biochemistry, molecular biology, etc.) at a level above the minimum 'B' average is normally expected. Admission requires a statement of the applicant's interests and objectives and supportive letters of reference. An appropriate faculty advisor must be identified, as well as potential sources of funds for research and for provision of a stipend for the student. Applications may be submitted at any time. Initial enrolment can be in the Fall, Winter or Summer semesters, with a preference for the Fall.

Degree Requirements

Students must complete at least 1.5 credits of prescribed courses with at least a 'B' average, and must satisfactorily write and defend a research thesis. Prescribed courses and additional courses are selected by the student in consultation with the advisor and advisory committee based on the student's background and their research and career objectives. The departmental Graduate Seminar course PABI*6440 is 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 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.
Instructor's signature required

Degree Requirements
Students must have successfully completed the department's graduate seminar course, PABI*6440, and have obtained at least a 'B' average in all courses prescribed by the advisory committee. There are no other specific course requirements. Prescribed courses and additional courses are selected by the student in consultation with the advisor and advisory committee based on the student's background, their research and career objectives. Students are required to satisfactorily complete a qualifying examination before the end of the fifth semester if they possess an MSc degree, or before the end of the seventh semester if they possess an honours baccalaureate or DVM degree. The qualifying examination is conducted by a committee of graduate faculty members with expertise in the areas of study, and includes written and oral components. The qualifying examination covers a breadth of knowledge of topics related to the student's research area, and depth of knowledge within this research area. To successfully complete the examination, students must have a broad general understanding of one of the departmental fields of study, and a current and detailed understanding of one or two additional areas in their field of study. The advisory committee identifies selected areas of study by the end of the second semester. In addition, the advisory committee is required to confirm that the student has demonstrated both ability and promise in research. This is based on performance in the research project and in courses and other academic activities. The thesis research is planned by the student in consultation with the advisor. The proposed thesis research is developed and defended as part of the course PABI*6440, Graduate Seminar in Pathobiology. Research plans and progress must be approved by the advisory committee. The program is completed within the satisfactory presentation and defence of a thesis, which includes a seminar presentation and a final oral examination by a committee that includes an external examiner and members of the graduate faculty. See also the Degree Regulations in the Graduate Calendar.

DVSc Program
The Department of Pathobiology participates in the DVSc program which provides advanced training in a specialty discipline of veterinary medicine, combined with course work and a thesis-based research project. Specialty training is offered in the areas of veterinary anatomic pathology, veterinary clinical pathology, veterinary clinical microbiology, laboratory animal science, wildlife and zoo animal medicine and pathology, avian 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 towards specialty certification in veterinary anatomic pathology, veterinary clinical pathology, laboratory animal science, veterinary clinical microbiology, or veterinary parasitology. 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. Assistance 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 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. The program is completed with the satisfactory presentation and defence of a thesis. The thesis involves the development and defence of a research program as part of the course PABI*6440, and have obtained at least a 'B' average in all courses prescribed by the program. Applications may be submitted at any time. Initial enrolment can be in the Fall, Winter or Summer semesters.

Degree Requirements
The degree requires a minimum of nine semesters of full-time study; the completion of at least 2.5 credits in courses prescribed by the student's advisory committee including completion of the department's graduate seminar course, with an 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.

Graduate Diploma Program
The objective of the diploma program 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.

Degree Requirements
The Graduate Diploma requires three semesters of full time study and completion of 1.5 credits of prescribed courses, including 0.5 credits in an applied course and no more than 0.5 credits in a Special Topics course. The remaining credits may be in the defined area of study, as prescribed by the faculty advisor. Diploma students must satisfactorily pass a final oral comprehensive examination on knowledge in their field of study. It will be conducted by faculty members in the Department of Pathobiology. There is no thesis, but students are required to write a paper that the advisor considers ready for submission to a peer reviewed scientific journal.

See also the Graduate Diploma Regulations of the Faculty of Graduate Studies.

Courses
General
PABI*6440 Graduate Seminar in Pathobiology S,F,W [0.50]
Following discussions of approaches to scientific research and communication, students will develop and submit a thorough written critical review of the literature on an agreed upon topic, and a detailed research proposal in the same topic area. This material will also be presented in the form of a public seminar.

Comparative Pathology
PABI*6060 Special Topics in Pathobiology F,W,S [0.50]
In-depth independent study of subjects related to student's principal area of interest. Major paper(s), laboratory studies, and/or written and oral examination, with or without seminar preparation.
Restriction(s): Instructor's signature required

PABI*6050 Applied Avian Pathology I F [0.50]
Examination and interpretation of gross and microscopic lesions of domestic poultry.
Restriction(s): Instructor's signature required

PABI*6060 Applied Avian Pathology II W [0.50]
A continuation of PABI*6050, emphasizing seasonal differences in diseases as well as diseases more commonly associated with winter conditions.
Restriction(s): Instructor's signature required

PABI*6070 Applied Avian Pathology III S [0.50]
A continuation of PABI*6060, emphasizing seasonal differences in diseases as well as diseases more commonly associated with summer conditions.
Restriction(s): Instructor's signature required

PABI*6221 Comparative Veterinary Pathology I U [0.50]
Pathological changes associated with diseases of amphibia, reptiles, wild and captive non-domestic birds, and wild mammals including fur-bearers. (Even numbered years)
Restriction(s): Instructor's signature required

PABI*6222 Comparative Veterinary Pathology II U [0.50]
Pathological changes associated with diseases of poultry and pet birds, fish and various laboratory animals. (Even numbered years)
Restriction(s): Instructor's signature required

PABI*6360 Applied Comparative Pathology I S,F,W [0.50]
Introductory course in the diagnostic pathology of mammals, birds, reptiles, amphibians, and fish. Cases may be restricted by animal taxa or context (e.g., free-ranging Canadian wildlife, zoological collections, aquaculture). The three Applied Comparative Pathology courses build in expected level of accomplishment.
Restriction(s): Instructor's signature required

PABI*6640 Applied Comparative Pathology II S,F,W [0.50]
Intermediate course in the diagnostic pathology of mammals, birds, reptiles, amphibians, and fish. Cases may be restricted by animal taxa or context (e.g., free-ranging Canadian wildlife, zoological collections, aquaculture). The three Applied Comparative Pathology courses build in expected level of accomplishment.
Restriction(s): Instructor's signature required

PABI*6650 Applied Comparative Pathology III S,F,W [0.50]
Advanced course in the diagnostic pathology of mammals, birds, reptiles, amphibians and fish. Cases may be restricted by animal taxa or context (e.g., free-ranging Canadian wildlife, zoological collections, aquaculture). The three Applied Comparative Pathology courses build in expected level of accomplishment.
Restriction(s): Instructor's signature required
PABI*6700 Laboratory Animal Science U [0.50]
Basic information on various aspects of laboratory animal science, including IACUC function, regulatory oversight, ethics, historical review of animal research, animal models and alternatives, experimental design and considerations, biology, management and use of common species in research.
Restrictions(s): Instructor's signature required

PABI*6710 Applied Laboratory Animal Science I U [0.50]
This course will emphasize practical aspects of laboratory animal science including research protocols, review, writing and reviewing standard operating procedures, animal monitoring, pathology procedures, and case management.
Restrictions(s): Instructor's signature required

PABI*6720 Applied Laboratory Animal Science II U [0.50]
Continuation of I with emphasis on biohazard and personnel safety, monitoring for disease, quality control and diagnostic procedures.
Restrictions(s): Instructor's signature required

PABI*6730 Applied Laboratory Animal Science III U [0.50]
Continuation of I and II, with emphasis on a comparison of programs and procedures in other facilities in Canada, nonhuman primate medicine, and surgical, clinical and necropsy procedures.
Restrictions(s): Instructor's signature required

PABI*6740 Avian Diseases U [0.50]
Detailed study of recent concepts of preventive medicine, diagnosis and therapeutics as applied to clinical recognition and control of avian diseases.
Restrictions(s): Instructor's signature required

Immunology
PABI*6100 Immunobiology F [0.50]
Major areas of immunology, including initiation, regulation, receptors, genetics, immune system development and function.

PABI*6190 Topics in Immunology W [0.50]
Aspects of immune and non-specific host resistance, diagnostic immunology and immune-mediated disease.

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.

PABI*6180 Clinical Bacteriology U [0.50]
Current techniques and approaches in diagnostic bacteriology.

PABI*6330 Viral Diseases F [0.50]
A study of important viral diseases of animals, with emphasis on etiology, host responses, diagnosis and control. (Odd numbered years)

PABI*6350 Molecular Epidemiology of Bacterial Diseases W [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.

PABI*6550 Epidemiology of Zoonoses W [0.50]
Characterization and distribution of diseases common to people and animals.
Prerequisite(s): MCB*6330

MCB*6330 [0.50] Molecular Biology of Viruses

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): Instructor's signature required

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)
Restriction(s): Instructor's signature required

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 control procedures. (Intended for students training in clinical pathology)
Restriction(s): Instructor's signature required

PABI*6080 Diagnostic Pathology I - Domestic Animals S,F,W [0.50]
An introductory course of diagnostic pathology with emphasis on the common and uncommon diseases of the whole body and respiratory, urinary and digestive (including liver and pancreas) systems. (Intended for students training in anatomic pathology.)
Restriction(s): Instructor's signature required

PABI*6090 Diagnostic Pathology II - Domestic Animals 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.)
Restriction(s): Instructor's signature required

PABI*6091 Diagnostic Pathology III - Domestic Animals 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.)
Restriction(s): Instructor's signature required

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.

PABI*6105 Integrative Pathology U [0.50]
Basic and interpretive tissue and biochemical concepts of disease in the liver, pancreas, kidney, endocrine and hemolymphatic systems. (Even-numbered years)
Restriction(s): Instructor's signature required

PABI*6110 Pathology I W [0.50]
Disease processes of the respiratory, integumentary, reproductive and skeletal systems. (Even-numbered years)
Restriction(s): Instructor's signature required

PABI*6130 Pathology II W [0.50]
Disease processes of the alimentary, central nervous, cardiovascular and muscular systems and special senses. (Odd-numbered years)
Restriction(s): Instructor's signature required

PABI*6300 Clinical Pathology I U [0.50]
Principles and applications of veterinary hematology and cytology, with emphasis on the hematopoietic systems.
Restriction(s): Instructor's signature required

PABI*6320 Clinical Pathology II W [0.50]
Principles and applications of veterinary hematology and cytology, with emphasis on the hematopoietic system.
Restriction(s): Instructor's signature required
Philosophy

Administrative Staff

Chair
Mark McCullagh (347 MacKinnon, Ext. 53221)
mcculla@uoguelph.ca

Graduate Coordinator
Patricia Sheridan (335 MacKinnon, Ext. 53219)
pmsherid@uoguelph.ca

Graduate Secretary
Janet Thackray (348 MacKinnon, Ext. 56265)
jthack@uoguelph.ca

Graduate Faculty

Andrew Bailey
BA, MA Oxford, PhD Calgary - Associate Professor and Chair

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 Goldberg
BA Toronto, MA McGill, PhD Michigan State - Associate Professor

John Hacker-Wright
BA Bradley, MA, PhD New York - Associate Professor

Jean Harvey
BA Wales, MA Simon Fraser, PhD British Columbia - Professor

Karen L. Houle
BSc, MA, PhD Guelph - Associate Professor

Jay Lampert
BA, MA, PhD Toronto - Professor

Stefan Linquist
BAH Simon Fraser, MSc New York, PhD Duke - Assistant Professor

Peter Lipton
BA York, MA, PhD Pittsburgh - Professor

Mark McCullagh
BA Toronto, PhD Pittsburgh - Associate Professor

Jeffrey A. Mitscherling
BA California (Santa Barbara), MA McMaster, PhD Guelph - Professor

Omid Payrow Shabani
BA, MA Carleton, PhD Ottawa - Associate 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 Wending
BA Michigan State, MA, PhD Toronto - Associate Professor

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, philosophy of religion, epistemology, philosophy of mind, metaphysics, philosophy of science. There is also a diversity of approaches within the department. There is faculty expertise in Continental, analytic, and other philosophical traditions and approaches. It is primarily a research degree and the program will involve either an MA thesis or the smaller Guided Research Project (together with a few more courses than with the thesis option).

Admission Requirements

A four-year bachelor's degree from a recognized university. Normally this will include at least a major in philosophy, although the program is also open to students who may not have had a substantial number of philosophy undergraduate courses but who provide evidence of philosophical ability. In all cases, in order to be considered for admission to the MA program, the department requires that the average grade over the last 10.00 credits of studies (i.e., a normal two years of full-time studies on the University of Guelph system) be at least 75%. All applicants are required to submit a sample of writing. Further details can be found on the Philosophy Department website.

Degree Requirements

All students must take the MA Seminar (PHIL*6950) and complete either a thesis of between 20,000 and 30,000 words or a research project of between 10,000 and 15,000 words. Candidates by thesis must take at least four semester-long courses plus the two-semester MA Seminar. Candidates by research project must take at least six semester-long courses plus the two-semester MA Seminar plus the Guided Research Project (PHIL*6990). Candidates with a degree other than philosophy will be assigned courses in accordance with their needs and background up to a maximum of six additional semester courses. There are also several prerequisite courses required for the MA. See http://www.uoguelph.ca/philosophy for details.

Regardless of the option chosen, the MA in Philosophy at Guelph is a research degree, in which the responsibility for study begins to shift from the faculty to the student. Students in both streams are expected to develop their own topic for research. The Philosophy MA can normally be completed in 4 semesters, whichever stream is chosen.

PhD Program

The University of Guelph offers a program leading to a PhD in philosophy. The aim of the PhD 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 fields of research. The program offers supervision in most of the traditional areas of philosophy but the special strengths of the program are in: 1) Continental, Social and Political Philosophy; (2) History of Western Philosophy; (3) Philosophy of Science, Mind and Language.

Admission Requirements

Admission to the program is restricted to those who have an MA in philosophy, or an outstanding record in undergraduate studies in philosophy.

Degree Requirements

Students are normally required to take between six and ten courses plus the PhD Research Seminar (PHIL*6960). Students must also demonstrate knowledge in at least five designated fields of study. This may be done by course work, by examination, by thesis or by a suitable combination of these. Students must pass an Oral Qualifying Examination by the end of their fifth semester in the program. Students in the program may be required to demonstrate competence in one or more skills which their advisory committee decides, in consultation with the program officer, is needed for their dissertation (e.g. a language other than English). PhD candidates must submit a thesis of not more than 75,000 words (250 pages). More details are available at http://www.uoguelph.ca/philosophy.

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.

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.

PHIL*6110 Philosophy of Religion U [0.50]
A critical examination of some selected major works or central problems in the philosophy of religion.

PHIL*6120 Philosophy of Mind U [0.50]
A study of contemporary theories of mind and philosophies of psychology.

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.

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.

PHIL*6200 Problems of Contemporary Philosophy U [0.50]
A study of a particular set of problems in contemporary philosophy.

PHIL*6210 Metaphysics U [0.50]
A critical examination of some selected major works or central problems in metaphysics.

PHIL*6220 Epistemology U [0.50]
A critical examination of some selected major works or central problems in epistemology.

PHIL*6230 Ethics U [0.50]
A critical examination of some selected contemporary works or problems in ethical theory.

PHIL*6240 Biomedical Ethics U [0.50]
A critical examination of some selected contemporary works or problems in biomedical ethics.
<table>
<thead>
<tr>
<th>Course Title</th>
<th>Credits</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHIL*610 Plato U [0.50]</td>
<td></td>
<td>A study of some of the major works of Plato.</td>
</tr>
<tr>
<td>PHIL*611 Aristotle U [0.50]</td>
<td></td>
<td>A study of some of the major works of Aristotle.</td>
</tr>
<tr>
<td>PHIL*620 Medieval Philosophy U [0.50]</td>
<td></td>
<td>A close examination of particular problems and texts of the medieval period</td>
</tr>
<tr>
<td>PHIL*630 Modern Philosophy U [0.50]</td>
<td></td>
<td>An examination of major texts, from Descartes to Mill.</td>
</tr>
<tr>
<td>PHIL*650 John Locke U [0.50]</td>
<td></td>
<td>A critical examination of the works of John Locke.</td>
</tr>
<tr>
<td>PHIL*651 Kant U [0.50]</td>
<td></td>
<td>A critical examination of the works of Immanuel Kant.</td>
</tr>
<tr>
<td>PHIL*660 Social and Political Philosophy U [0.50]</td>
<td></td>
<td>A critical examination of some selected contemporary works or central problems in the field of social philosophy.</td>
</tr>
<tr>
<td>PHIL*670 Survey of Ancient Philosophy U [0.50]</td>
<td></td>
<td>A survey of ancient philosophy.</td>
</tr>
<tr>
<td>PHIL*671 Survey of Early Modern Philosophy U [0.50]</td>
<td></td>
<td>A survey of modern philosophy from Hobbes to Hume.</td>
</tr>
<tr>
<td>PHIL*672 History of the Philosophy of Science U [0.50]</td>
<td></td>
<td>A survey of the history of the philosophy of science from the Presocratics to the Positivists.</td>
</tr>
<tr>
<td>PHIL*673 Contemporary Philosophy of Science U [0.50]</td>
<td></td>
<td>An examination of the contemporary discipline of the philosophy of science.</td>
</tr>
<tr>
<td>PHIL*674 Philosophy of Biology U [0.50]</td>
<td></td>
<td>A general introduction to the history and philosophy of biology.</td>
</tr>
<tr>
<td>PHIL*675 Science and Ethics U [0.50]</td>
<td></td>
<td>A consideration of the problems which arise in the conjunction of science and ethics.</td>
</tr>
<tr>
<td>PHIL*680 Survey of Late Modern Philosophy U [0.50]</td>
<td></td>
<td>A survey of modern philosophy from Kant to the late 19th century.</td>
</tr>
<tr>
<td>PHIL*690 Reading Course U [0.50]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PHIL*691 Selected Topics I U [0.50]</td>
<td></td>
<td>Topics in this course will vary from offering to offering.</td>
</tr>
<tr>
<td>PHIL*692 Selected Topics II U [0.50]</td>
<td></td>
<td>Topics in this course will vary from offering to offering.</td>
</tr>
<tr>
<td>PHIL*693 MA Seminar U [0.50]</td>
<td></td>
<td>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.</td>
</tr>
<tr>
<td>PHIL*694 PhD Graduate Seminar U [0.50]</td>
<td></td>
<td>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 second year PhD students. Please refer to the Philosophy Department website for a comprehensive description of this course.</td>
</tr>
<tr>
<td>PHIL*699 Guided Research Project U [1.00]</td>
<td></td>
<td>A guided research project undertaken by students doing an MA by course work, under the supervision of a faculty member.</td>
</tr>
</tbody>
</table>
Physics

The Departments of Physics at the Universities of Guelph and Waterloo offer a joint program leading to MSc and PhD degrees. The Guelph-Waterloo Physics Institute consists of members from both university departments and is administered by a joint co-ordinating committee. Students interested in graduate work in physics at either university should consult the application requirements and the on-line application procedures available from the web-site http://gwp.on.ca. Students are ultimately registered at the university at which their advisor is located. A student comes under the general regulations of the university at which he or she is registered, and the degree is granted by that university.

Administrative Staff

Graduate teaching and research in physics at the University of Guelph are operated through the Guelph-Waterloo Physics Institute.

Director of the Institute
Brian McNamara (Waterloo - (519) 888-4567, Ext. 38170) mcnamara@uwaterloo.ca

Associate Director of the Institute
Paul Garrett (Guelph, 220 MacNaughton, Ext. 52192) pgarrett@physics.uoguelph.ca

Assistant to the Director
Linda Stadig (Waterloo (519) 888-4567, Ext. 37598, Ext. Guelph (519) 824-4120 Ext. 52263) gwp@sciborg.uwaterloo.ca

Chair
Eric Poisson (452 MacNaughton, Ext. 53949) poisson@physics.uoguelph.ca

Graduate Coordinator
Paul Garrett (220 MacNaughton, Ext. 52192) pgarrett@physics.uoguelph.ca

Graduate Secretary
Reggi Vallilite (209 MacNaughton, Ext. 52262) rv@physics.uoguelph.ca

Graduate Faculty

Leonid S. Brown
MSc, PhD Moscow State - Professor

James H. Davis
BS, BA Moorehead State College, PhD Manitoba - Professor

John R. Dutcher
BSc Dalhouse, MSc British Columbia, PhD Simon Fraser - Professor

Paul E. Garrett
BSc Queen's, MSc, PhD McMaster - Professor and Associate Director GWPI

Ralf Gellert
Dipl Phys, PhD Darmstadt - Associate Professor

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

Stefan W. Kycia
BSc McGill; MS Pennsylvania; PhD Iowa - Associate Professor

Vladimir Ladizhansky
BS Moscow Institute of Physics and Technology; MS, PhD Weizmann Institute of Science (Rehovot, Israel) - Associate Professor

Luís Lehner
Licenciado en Fisica Cordoba, PhD Pittsburg - Associate Professor

Elisabeth J. Nicol
BSc Mount Allison, MSc, PhD McMaster - Professor

Joanne M. O'Meara
BSc, PhD McMaster - Associate Professor

Eric Poisson
BSc Laval, MSc, PhD Alberta - Professor and Chair

Xiao-Rong Qin
BSc, MSc Tsinghua (Beijing), PhD Simon Fraser - Associate Professor

Donald E. Sullivan
BSc McGill, PhD M.I.T. - Professor

Carl E. Svensson
BSc, PhD McMaster - Professor

Robert Wickham
BSc Toronto, PhD Chicago - Associate Professor and Graduate Coordinator

Martin Williams
PhD Imperial College, London - Assistant Professor and Undergraduate Coordinator

Graduate Faculty from the University of Waterloo

Michael Balogh
BSc McMaster, PhD Victoria - Associate Professor

Jonathan Baugh
BS Tennessee, PhD North Carolina - Assistant Professor

Peter F. Bernath
BSc Waterloo, PhD M.I.T. - Professor

Kostadinika Bizheva
BS, MS Plovdiv, MS, PhD Tufts - Associate Professor

Anton Burkov
BS, MS Plovdiv, MS, PhD Tufts - Assistant Professor

Melanie C. Campbell
BSc Toronto, MSc Waterloo, PhD Australian National, FAAO - Professor

Z.Y. 'Jeff' Chen
BSc Fuden, PhD Waterloo, PhD Australian National - Professor

Andrew M. Childs
BS Cal Tech, PhD MIT - Assistant Professor

Walter W. Duley
BEng McGill, DIC, PhD Imperial College, DSc London - Professor

Joseph Emerson
MSc, PhD British Columbia - Assistant Professor

Michael Fich
BSc Waterloo, MSc, PhD California - Professor

James Forrest
BSc Simon Fraser, MSc PhD Guelph - Professor and Associate Dean of Research, Faculty of Science

Michel Gingras
BSc, MSc Laval, PhD British Columbia - Professor

Bae-Youn Ha
BSc, MS Korea, PhD Maryland - Associate Professor

Gretchen L. Harris
BA Mount Holyoke College, MA Wesleyan, PhD Toronto - Associate Professor

David G. Hawthorn
BSc McMaster, PhD Toronto - Assistant Professor

Thorsten Hesjedal
BSc Universitat Stuttgart, MSc Eberhard-Karls-Universitats Tubingen, PhD Humboldt Universitatis - Associate Professor

Robert Hill
BSc, PhD Bristol - Associate Professor

Michael Hudson
BSc Montreal, PhD Cambridge - Associate Professor and Associate Dean of Science (Computing), Faculty of Science

Stefan H.J. Idziak
BSc McGill, PhD Pennsylvania - Associate Professor

Thomas Jennewein
MSc Innsbruck, PhD Vienna - Associate Professor

Lyndon Jones
BSc Cardiff, PhD Birmingham - Associate Professor

Achim Kempf
BSc Heidelberg, PhD Munich - Associate Professor

Holger Kleinke
BSc, MSc Münster, PhD Mainz - Professor

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

Raymond Laflamme
BSc Laval, PhD Cambridge - Professor

Yuri Leonenko
MSc Novosibirsk, PhD Russia - Assistant Professor

Zoya Leonenko
MSc, PhD Novosibirsk - Associate Professor

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

Wing-Ki Liu
BSc, MSc, PhD Illinois - Professor

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

Adrian Lupascu
BSc, MSc Bucharest (Romania), PhD Netherlands - Assistant Professor

Norbert I. Lütkenhaus
MSc München, PhD Scotland, Habilitation Germany - Associate Professor

Brian McNamara

Niayesh Afshordi
BA Iran, BSc Providence, PhD Princeton - Assistant Professor

2012-2013 Graduate Calendar May 13, 2014
IX. Graduate Programs, Physics

BS Villanova, MA, PhD Virginia - Professor and Director of the Institute
Robert B. Mann
BSc McMaster, MSc, PhD Toronto - Professor
James Martin
BSc, MSc, PhD Waterloo - Associate Professor
F.R.W. McCourt
BSc, PhD British Columbia, PhD Alberta - Professor
Roger Melko
BSc, MSc Waterloo, MA, PhD UC Santa Barbara - Assistant Professor
Michele Mosca
BMath Waterloo, MSc, DPhil Oxford - Professor
Linda F. Nazar
BSc British Columbia, PhD Toronto - Professor
Hartwig Peemöller
BSc Winnipeg, MSc Victoria, PhD Waterloo - Professor
Marco Piani
MSc, PhD Trieste Italy - Assistant Professor
Kevin Resch
BSc Queen’s, MSc, PhD Toronto - Assistant Professor
Joseph Sanderson
BSc, PhD London - Associate Professor
Gunter A. Scholz
BSc Simon Fraser, MSc McMaster, PhD Simon Fraser - Associate Professor
James J. Sloan
BSc, PhD Queen’s - Professor
Donna Strickland
BEng McMaster, PhD Rochester - Associate Professor and Associate Chair
James Taylor
BSc, MSc Toronto, PhD Victoria - Assistant Professor
Russell Thompson
BSc Ottawa, MSc Regina, PhD Western Ontario - Assistant Professor
Paul S. Wesson
BSc London, PhD Cambridge, FRAS London - Professor
Frank Wilhelm-Mauch
BSc Vordiplom, MSc (Dipl.-Phys.), PhD Karlsruhe (Germany) - Professor
David Yeveck
AB Harvard, MA, PhD Princeton, Docuent Lund - Professor

MSc Program

The MSc programs provide for emphasis on astrophysics and gravitation, atomic, molecular and optical physics, biophysics, chemical physics, condensed matter and material physics, industrial and applied physics, subatomic physics, and quantum computing.

Three options are available for the MSc degree:

- A research-based option in which the student is required to complete four one-semester courses (at least 2.0 course credits) and a thesis.
- A course-work option in which the student is required to complete eight one-semester courses (at least 4.0 course credits), one of which must be a research project course that includes a report.
- A co-operative option in which the student spends two semesters working in a government or industrial laboratory. The student is required to complete four one-semester courses (at least 2.0 course credits) and a thesis.

Admission Requirements

Application for admission should be made as early as possible using on-line application methods described on the web-site: http://gwp.on.ca/application/index.html. 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.

Successful applicants are encouraged to start their graduate studies in May or September, but a January starting date is possible. Academic transcripts and other supporting documents should be forwarded as soon as they become available. Admission to the program cannot be granted until all requirements have been met and all documents submitted.

Applications are considered by the Admissions Committee. It should be noted that students will normally be admitted only if an advisor can be found to oversee their research. Since there are a limited number of openings each year, applicants are advised to state alternative areas of research on the preference form supplied (see web-site http://gwp.on.ca/).

MSc Co-operative Option

In addition to the admission requirements described above, admission to the co-op option is restricted to Canadian citizens and permanent residents.

Degree Requirements

Research-Based MSc Option

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 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-semester graduate courses may be permitted, upon recommendation of the advisor and with the approval of the co-ordinating committee, to transfer into the PhD program without completing an MSc thesis.

An average of at least 70% must be obtained in the required courses. A minimum grade of 60% is required for a pass in each course. No more than two courses, of the first four taken, can have a grade of less than 70%. If a student does not meet these minimum grade requirements, or receives a failing grade in any course, he/she may be required to withdraw from the program.

MSc Co-operative Option

Students enter the co-op MSc program in September. The first term of the program is spent taking two courses (for all except those in biophysics **, one of these courses must be chosen from PHYS*7010, PHYS*7030, PHYS*7040, PHYS*7060, PHYS*7670, and PHYS*7810) and performing the duties of a regular teaching assistant. During this term, the student will discuss work-term prospects with the Guelph and Waterloo personnel responsible for co-op activities and conduct interviews with potential employers. Satisfactory performance in this phase of the program allows the student to spend the next two terms working in an industrial or government laboratory. Upon completion of the work terms, the student must submit a work report as discussed below.

The student must complete a minimum of two additional graduate courses and complete a research project under the supervision of a faculty member in accordance with the regular thesis requirements of the MSc degree program, as outlined by the Faculty of Graduate Studies.

**Exception: In place of the core physics course biophysics students may choose any course approved by the student's advisory committee and the graduate coordinator.

Course-Based MSc Option

Eight one-term courses (0.50 unit weight) acceptable for graduate credit, including a project course summarized in a report, are required. The project must be approved by the candidate's advisor and the report read and approved by the advisor and one other faculty member. [Exception: biophysics students taking the course-based MSc option are required to take only one of the core courses PHYS*7010, PHYS*7030, PHYS*7040, PHYS*7060, PHYS*7670, and PHYS*7810, and PHYS*7810]. Two of the courses may be undergraduate courses approved by the advisor and the Graduate Advisory Committee. If they are physics courses, they must be at the fourth-year level. This program is recommended for those planning careers requiring a broad non-specialized knowledge of physics (for example, high school teaching).

PhD Program

Two options are available for the PhD degree:

- A research-based option in which the student is required to complete four one-semester courses (2.0 credits) and a thesis.
- A co-operative option in which the student spends two semesters working in a government or industrial laboratory. The student is required to complete four one-semester courses (2.0 credits) and a thesis.

Admission Requirements

A MSc degree in physics from an approved university or college with at least a B standing (75%) is normally required for entrance into the PhD program. Other requirements are the same as those described above for the MSc program (see web-site http://gwp.on.ca/).

PhD Co-operative Option

In addition to the admission requirements described above, admission to the co-op option is restricted to Canadian citizens or permanent residents.

May 13, 2014
Degree Requirements

Four one-term courses not including any already taken for MSc credit are required; courses taken during the MSc program and in excess of those required will, however, be allowed for PhD credit. The extra courses must be identified prior to admission. The core courses for the program are Quantum Mechanics I (PHYS*7010), Introduction to Quantum Field Theory (PHYS*7030), Statistical Physics I (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 I (PHYS*7010), Statistical Physics I (PHYS*7040) and Electromagnetic Theory (PHYS*7060) or their equivalent should be completed. (Exception: Biophysics students must have taken at least one of Quantum Mechanics I (PHYS*7010), Statistical Physics I (PHYS*7040), and Electromagnetic Theory (PHYS*7060) by the completion of the first year of the PhD program.) One of the required courses may be an undergraduate course outside the student’s main field of study and must be approved by the student’s advisory committee and the graduate 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 60% is required for a pass in each course. No more than two courses, of the first four taken, can have a grade of less than 70%. If a student does not meet these minimum grade requirements, or receives a failing grade in any course, he/she may be required to withdraw from the program.

PhD candidates are required to pass a Qualifying Examination normally during the first year of the program; in any case, it must be passed no later than the fifth semester in which he/she is enrolled. This is an oral examination of approximately two hours' duration before a committee that includes representation from the student's advisory committee. It is designed to test the student's knowledge of the fundamentals and applications of physics closely related to the thesis topic. An assessment of the student's ability in research will be a factor in determining the examination result. If a student has not passed the Qualifying Examination by the end of the fifth semester in which they are enrolled, he/she may be required to withdraw from the program.

PhD students must meet their advisory committee members at least once a year to present a written and oral report on their progress. Candidates must present a thesis embodying the results of original research conducted by them on an advanced topic. The thesis is defended before a committee which may also examine the student's knowledge of related material.

PhD Co-operative Option

Students normally enter the co-op PhD program in September, following completion of their MSc degree. The student first spends one or two academic terms on campus, taking a minimum of two courses per term and performing the regular duties of a teaching assistant. During this time, the student will discuss work term prospects with the Guelph and Waterloo personnel responsible for co-op activities and conduct interviews with potential employers. After satisfactory performance in the academic term(s), the student spends a full year in an industrial or government laboratory.

Students must complete all three of the core courses including one of PHYS*7010, PHYS*7040 and PHYS*7060 by the end of their first two academic terms in the program. (Exception: Biophysics students must take at least one of the three core courses.) A total of four graduate courses (2.0 credits) are required (excluding those already taken for MSc credit).

The student is required to pass a Qualifying Examination and complete, under the supervision of a faculty member, a research project on an advanced topic. A thesis embodying the results of original research conducted by the student must be presented and defended before a committee. 

Interdepartmental Programs

Biophysics Interdepartmental Group

The Department of Physics participates in the MSc/PhD programs in biophysics. Please consult the Biophysics listing for a detailed description of the graduate programs offered by the Biophysics Interdepartmental Group.

Courses

* Courses offered annually. Other courses are offered on an alternate year basis and as requested.

Perimeter Scholars' Institute Courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHYS*6010</td>
<td>PSI Quantum Field Theory I</td>
<td>0.50</td>
</tr>
<tr>
<td>PHYS*6020</td>
<td>PSI Statistical Physics</td>
<td>0.50</td>
</tr>
</tbody>
</table>

Canonical quantization of fields, perturbation theory, derivation of Feynman diagrams, applications in particle and condensed matter theory, renormalization in phi^4.


IX. Graduate Programs, Physics

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHYS*6030</td>
<td>PSI Quantum Field Theory II</td>
<td>0.50</td>
</tr>
<tr>
<td>PHYS*6040</td>
<td>PSI Relativity</td>
<td>0.50</td>
</tr>
<tr>
<td>PHYS*6050</td>
<td>PSI Quantum Theory</td>
<td>0.50</td>
</tr>
<tr>
<td>PHYS*6060</td>
<td>PSI Information and Data Analysis</td>
<td>0.50</td>
</tr>
<tr>
<td>PHYS*6070</td>
<td>PSI Dynamical Systems</td>
<td>0.50</td>
</tr>
<tr>
<td>PHYS*6080</td>
<td>PSI Computation</td>
<td>0.50</td>
</tr>
<tr>
<td>PHYS*6110</td>
<td>PSI Cosmology</td>
<td>0.25</td>
</tr>
<tr>
<td>PHYS*6220</td>
<td>PSI Standard Model</td>
<td>0.25</td>
</tr>
<tr>
<td>PHYS*6230</td>
<td>PSI String Theory</td>
<td>0.25</td>
</tr>
<tr>
<td>PHYS*6350</td>
<td>PSI Quantum Information Review</td>
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<td>PHYS*6360</td>
<td>PSI Gravitational Physics Review</td>
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<tr>
<td>PHYS*6370</td>
<td>PSI Condensed Matter Theory</td>
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<tr>
<td>PHYS*6380</td>
<td>PSI Quantum Gravity</td>
<td>0.25</td>
</tr>
<tr>
<td>PHYS*6410</td>
<td>PSI Explorations in Quantum Information</td>
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<tr>
<td>PHYS*6420</td>
<td>PSI Explorations in Gravitational Physics</td>
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<td>PHYS*6430</td>
<td>PSI Exploration in Condensed Matter Theory</td>
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<tr>
<td>PHYS*6440</td>
<td>PSI Exploration in Quantum Gravity</td>
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</tr>
<tr>
<td>PHYS*6450</td>
<td>PSI Explorations in Foundations of Quantum Theory</td>
<td>0.25</td>
</tr>
</tbody>
</table>

Feynman Path Integral, abelian and nonabelian gauge theories and their quantization, spontaneous symmetry breaking, nonperturbative techniques: lattice field theory, Wilsonian renormalization.

Special relativity, foundations of general relativity, Riemannian geometry, Einstein's equations, FRW and Schwarzschild geometries and their properties.


Probability, entropy, Bayesian inference and information theory. Maximum likelihood methods, common probability distributions, applications to real data including Monte Carlo methods.

Maps, flows, stability, fixed points, attractors, chaos, bifurcations, ergodicity, approach to chaos. Hamiltonian systems, Liouville, measure, Poincare theorem, integrable systems with examples.

Common algorithms for ode and pde solving, with numerical analysis. Common tasks in linear algebra. Focus on how to write a good code, test it, and obtain a reliable result. Parallel programming.

FRW metric, Hubble expansion, dark energy, dark matter, CMB, Thermodynamic history of early universe. Growth of perturbations, CDM model of structure formation and comparison to observations, cosmic microwave background anisotropies, inflation and observational tests.

Application of Yan-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.

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.

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.

Review of selected topics in Quantum Information.

Review of selected topics in Gravitational Physics.

Review of selected topics in Condensed Matter Theory.

Review of selected topics in Quantum Gravity.

Review of selected topics in Quantum Gravitiy.

Review of selected topics in Foundations of Quantum Theory.

Review of selected topics in Quantum Information.

Review of selected topics in Gravitational Physics.

Review of selected topics in Condensed Matter Theory.

Review of selected topics in Quantum Gravity.

Review of selected topics in Foundations of Quantum Theory.
**Basic Group**

<table>
<thead>
<tr>
<th>Course Code</th>
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<tbody>
<tr>
<td>PHYS*7010</td>
<td>Quantum Mechanics I * U [0.50]</td>
<td></td>
</tr>
<tr>
<td>PHYS*7020</td>
<td>Quantum Mechanics II U [0.50]</td>
<td></td>
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<tr>
<td>PHYS*7030</td>
<td>Quantum Field Theory U [0.50]</td>
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<tr>
<td>PHYS*7040</td>
<td>Statistical Physics I* U [0.50]</td>
<td></td>
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<tr>
<td>PHYS*7050</td>
<td>Statistical Physics II U [0.50]</td>
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<tr>
<td>PHYS*7060</td>
<td>Electromagnetic Theory * U [0.50]</td>
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<tr>
<td>PHYS*7070</td>
<td>Applications of Group Theory U [0.50]</td>
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<tr>
<td>PHYS*7080</td>
<td>Introduction to Quantum Information Processing F</td>
<td>[0.50]</td>
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<tr>
<td>PHYS*7090</td>
<td>Green's Function Method U [0.50]</td>
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**Subatomic and Nuclear**

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<tr>
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<tr>
<td>PHYS*7030</td>
<td>Quantum Field Theory U [0.50]</td>
<td></td>
</tr>
<tr>
<td>PHYS*7150</td>
<td>Nuclear Physics U [0.50]</td>
<td></td>
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<tr>
<td>PHYS*7160</td>
<td>Special Topics in Subatomic and Nuclear Physics U</td>
<td>[0.50]</td>
</tr>
<tr>
<td>PHYS*7170</td>
<td>Intermediate and High Energy Physics U [0.50]</td>
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**Astronomy and Astrophysics**

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<tr>
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<tr>
<td>PHYS*7810</td>
<td>Fundamentals of Astrophysics U [0.50]</td>
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<tr>
<td>PHYS*7850</td>
<td>Quantum Field Theory for Cosmology U [0.50]</td>
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<td>PHYS*7870</td>
<td>Cosmology U [0.50]</td>
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<tr>
<td>PHYS*7890</td>
<td>Special Topics in Astronomy U [0.50]</td>
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<tr>
<td>PHYS*7900</td>
<td>Special Topics in Astrophysics U [0.25]</td>
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<tr>
<td>PHYS*7910</td>
<td>Special Topics in Gravitation and Cosmology U [0.25]</td>
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**Atomic and Molecular**

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<tr>
<th>Course Code</th>
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<tr>
<td>PHYS*7100</td>
<td>Atomic Physics U [0.50]</td>
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<tr>
<td>PHYS*7130</td>
<td>Molecular Physics U [0.50]</td>
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**Condensed Matter**

<table>
<thead>
<tr>
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<tr>
<td>PHYS*7310</td>
<td>Solid State Physics I U [0.50]</td>
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</tr>
<tr>
<td>PHYS*7320</td>
<td>Solid State Physics II U [0.50]</td>
<td></td>
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</tbody>
</table>
### Biophysics

**PHYS*7330 Special Topics in Theoretical Condensed Matter Physics U [0.50]**

**PHYS*7370 Special Topics in Surface Physics U [0.50]**

**PHYS*7510 Cellular Biophysics U [0.50]**

The physics of cellular structure and function; membrane theories, diffusion and active transport, bioelectric phenomena; intracellular motion, thermodynamics; selected topics of current interest and seminar.

**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.

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

Offered on demand

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

Offered on demand

### Applied Physics (including Technical Methods)

**PHYS*7140 Nonlinear Optics U [0.50]**

Classical and Quantum Mechanical descriptions of nonlinear susceptibility, nonlinear wave propagation, nonlinear effects such as Peckel's and Kerr effects, harmonic generation, phase conjugation and stimulated scattering processes.

**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.

**PHYS*7470 Optical Electronics U [0.50]**

Optoelectronic component fabrication, light propagation in linear and nonlinear media, optical fiber properties, electro-optic and acousto-optic modulation, spontaneous and stimulated emission, semiconductor lasers and detectors, noise effects in fiber systems.

### Special Courses (offered on demand only)

**PHYS*7120 Special Topics in Theoretical Physics U [0.50]**

**PHYS*7710 Special Lecture and Reading Course U [0.50]**

**PHYS*7730 Special Topics in Physics U [0.50]**

**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.

**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
Plant Agriculture

The MSc and PhD programs in the Department of Plant Agriculture offer specialization in three broad fields of the Plant Sciences: 1) plant breeding and genetics; 2) plant biochemistry and physiology; and 3) crop production systems.

• **Plant Breeding and Genetics** has long been a key focus of our faculty and students. Through breeding and biotechnology, Guelph researchers help society by developing new field-crop, fruit, ornamental and vegetable cultivars that are grown in Canada and worldwide. Also, Plant Agriculture faculty and students seek both to understand the fundamental mechanisms that enable plant improvements and to discover novel methodologies and technologies that will be the foundation for future advances.

• **Plant Biochemistry and Physiology** is a broad discipline. Faculty and students in this area study the response of plants to environmental change and plant development at the ecosystem, whole plant, and molecular levels. Students investigate ecologically friendly management strategies, study underlying molecular and biochemical mechanisms that regulate plant development, investigate how plant performance can be optimized in the field or closed environments, and contribute to cultivar development

• **Crop Production Systems** research seeks to develop or test agricultural management strategies for yield improvement and economically and environmentally sound production practices in field and horticultural crops such as ornamentals and turf. Students assist producers and industry in the control of weeds, insects and plant diseases, and investigate new management protocols for production of high quality crops.

**Administrative Staff**

**Chair**
K. Peter Pauls (314 Crop Science Building, Ext. 53386)
pauls@uoguelph.ca

**Graduate Coordinator**
Barry J. Shelp (4237 Bovey Building, Ext. 53089)
bshelp@uoguelph.ca

**Associate Graduate Coordinator**
Istvan Rajcan (221 Crop Science Building, Ext. 53564)
irajcan@uoguelph.ca

**Graduate Secretary**
Jean G. Wolting (1105 Bovey Building, Ext. 56077)
wjwolting@uoguelph.ca

**Graduate Faculty**

Stephen R. Bowley
BS, MSc Guelph, PhD Kentucky - Associate Professor

Gale G. Bozzo
BSc, MSc York, PhD Queen's - Assistant Professor

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

Adam Dale
BSc, PhD Sheffield - Professor

William Deen
BSc, MSc, PhD Guelph - Associate Professor

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

Duane E. Falk
BSc, MSc Montana State, PhD Guelph - Associate Professor

Chris Gillard
BSc, MSc, Guelph - Assistant Professor

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

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

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

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

Lewis Lukens
BSc Carleton College, PhD Minnesota - Associate Professor

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

Ralph Martin
BA, MSc Carleton, PhD McGill - Professor and Loblaw Chair Sustainable Food Production

Mary Ruth McDonald
BSc, MSc Guelph - Professor

Alan W. McKeown
BSc, MSc Guelph, PhD Michigan - Associate Professor

Barry J. Micallef
BSc, MSc Guelph, PhD Wisconsin-Madison - Associate Professor

Amar K. Mohanty
BSc, MSc, PhD Utahk - Professor

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

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

Manish N. Raizada
BSc Western, PhD Stanford - Associate Professor

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

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

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

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

Barry J. Shelp
BSc, MSc Brock, PhD Queen's - Professor and Graduate Coordinator

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

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

J. Alan Sullivan
BSc, MSc, PhD Guelph - Professor

Clarence J. Swanton
BSc Toronto, MSc Guelph, PhD Western Ontario - Professor

Francois Tardif
BSc, MSc, PhD Laval - Associate Professor

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

David J. Wolyn
BS Rutgers, MS, PhD Wisconsin - Professor and Acting Chair

**MSC Program**

The Department of Plant Agriculture offers an MSc program in three broad fields of the Plant Sciences: 1) plant breeding and genetics; 2) plant biochemistry and physiology; and 3) crop production systems. Students conduct basic and/or applied research on topics within these fields.

**Admission Requirements**

Applicants should have a baccalaureate degree in an honours plant science/biology program, or the equivalent, from a recognized university or college with an average academic standing of at least 'B' during the last two years of full-time study (or equivalent). To assist in identifying a suitable thesis advisor(s), applicants should submit a short statement of research interests. Supportive letters of reference are essential and should outline the applicant's strengths and weaknesses. Students may be admitted in the Fall, Winter or Summer semesters. The University of Guelph requires that applicants from some foreign institutions have a MSc (or equivalent) degree before they are considered for admission to the University of Guelph's MSc program.

**Degree Requirements**

A program of prescribed courses (at least 1.5 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 three broad fields of the Plant Sciences: 1) plant breeding and genetics; 2) plant biochemistry and physiology; and 3) crop production systems. Students conduct research on topics within these fields.
Admission Requirements
The usual requirement for admission into the PhD program is a MSc degree by thesis in a field appropriate to their proposed area of specialization with a minimum ‘B’ average and supportive letters of reference. Direct admission to the PhD program is permitted to applicants holding an honours baccalaureate degree and demonstrating extraordinary academic and research capabilities. It is also possible for a student to transfer from the MSc without completing the requirements for that degree if the student has an excellent academic record and has strong research progress that can be expanded to the doctoral level. The request for transfer must be initiated by the student and must be done no earlier than the end of the second semester and no later than the end of the fourth semester. Applicants should submit a statement of research interests, background experiences, and career goals to assist in the identification of an appropriate faculty adviser with the resources necessary to support the thesis research. Students may be admitted in the Fall, Winter or Spring semesters. In some instances, applicants who already hold a MSc may be required to initially register in the MSc program.

Degree Requirements
The major emphasis in the PhD program is on research and the preparation and defense of an acceptable thesis. All PhD candidates must complete a thesis and present a seminar -in conjunction with the final oral examination. Students are required to participate in the Seminar PLNT*6400 and in a Departmental Colloquium course dealing with current topics. There are no other specific course requirements. It is usual for most students, in consultation with their advisory committee, to select some appropriate courses in preparation for the qualifying examination and thesis research. The qualifying examination is in two parts (written and oral) and evaluates the student’s knowledge of their field of specialization and related topics. The qualifying examination is taken no later than the fifth semester. For students who have transferred from the MSc program or have been admitted directly to the PhD program from a BSc, the qualifying examination is taken no later than the seventh semester. The advisory committee is required to submit a written evaluation of the student’s performance in research and the student’s potential as a researcher. Upon completion of the qualifying examination, the student becomes a candidate for the PhD degree.

All students are expected to participate in Departmental events, with particular emphasis on seminar series.

Collaborative Programs
Toxicology MSc/PhD
The Department of Plant Agriculture participates in the MSc/PhD program in toxicology. Please consult the Toxicology listing for a detailed description of the MSc/PhD collaborative program.

Courses
Plant Breeding and Genetics

PLNT*6100 Advanced Plant Breeding I W [0.50]
The practical consideration of genetic theory and biological limitations to improving plant populations and developing cultivars will be discussed. Current and emerging breeding methodologies and sources of variation used to achieve plant breeding goals will be examined through lectures, paper discussion, site visits and invited talks.

PLNT*6160 Advanced Plant Breeding II W [0.50]
Fundamentals of quantitative genetics. Topics will include gene and genotype frequencies means, variances, covariances and resemblance among relatives. Lecture topics will be expanded through discussion of classic and current papers. (Offered in odd numbered years)

PLNT*6250 Colloquium in Plant Genetics and Breeding U [0.25]
An open discussion course designed to review and critically analyse contemporary issues in plant genetics and breeding.

PLNT*6260 Advanced Plant Genetics I F [0.50]
A lecture and discussion course examining the underlying principles of genetics and the recent advances in plant genetics. Topics will include: structure of the genome, experiments to measure and experimentally describe phenotypes, population structures, and molecular basis of inheritance of a phenotype.

PLNT*6290 Advanced Plant Genetics II W [0.50]
A lecture and discussion course examining classical and molecular genetic investigations for understanding the genetic basis and regulation of physiological processes in plants. (Offered in even-numbered years)

PLNT*6340 Plant Breeding F [0.50]
This course examines principles of plant breeding in self- and cross-pollinated crops. Additional topics include crop domestication, mating systems, heritability, gain from selection, disease resistance, polyploidy, marker assisted selection and government regulations.

PLNT*6500 Applied Bioinformatics W [0.50]
The goal of this course is to provide an introductory understanding of the databases and methods used in computational molecular biology research. Topics covered will include reviewing major molecular databases and their structures, constructing sequence alignments, constructing phylogenetics, and finding motifs and genes in biological sequences. Lab sessions will include an introduction to Unix and Perl for the biologist and hands-on use of several molecular data analysis programs.

Prerequisite(s): Undergraduate level statistics class (such as STAT*2040 or STAT*2100) and undergraduate level molecular biology class (such as MBG*2200).

Plant Biochemistry and Physiology

PLNT*6010 Physiology of Crop Yield W [0.50]
This course covers factors affecting biomass production and yield, with primary focus on phenomena measured at the whole canopy scale. Yield-limiting abiotic stresses (temperature, water deficit, nutrient deficiency) are considered in detail, as are technical aspects of instrumentation used in crop physiology research. (Offered annually)

Prerequisite(s): PBIO*3110 or permission of instructor

PLNT*6110 Fruit and Vegetable Technology F [0.50]
The course is primarily intended to address science and technology aspects of fruits and vegetables, with specific reference to storage, packaging, quality, processing, products and ingredients, health regulatory properties and biotechnology issues etc. Methods of instruction include lectures and seminars. Students are evaluated during their seminar presentations, term papers and participation in discussions. (Offered in even-numbered years)

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.

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 will be 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

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 will be 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 will be discussed. (Offered in even numbered years)

Crop Production Systems

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.

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.

PLNT*6280 Invasive Plant Ecology in Natural and Agricultural Systems W [0.50]
This course will focus on the ecological principles that are important in understanding the potential for a plant species to become invasive. Students will be able to use this knowledge to facilitate management of these species under field conditions. (Offered in odd years)

Prerequisite(s): CROP*4240 or BOT*2100 or BOT*3120

General

PLNT*6800 Plant Disease Epidemiology and Management F [0.50]
Epidemiology and management of plant diseases caused by fungi, viruses, and bacteria. (Offered in alternate years.)
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Description</th>
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<tbody>
<tr>
<td>PLNT*6170</td>
<td>Statistics in Plant Agriculture W [0.50]</td>
<td></td>
<td>The application of statistical techniques to research in plant agriculture. SAS will be the software used to perform data analysis. Emphasis will be placed on statistical principles, the design of experiments, the testing of hypotheses, and communication of findings to other scientists.</td>
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<tr>
<td>PLNT*6400</td>
<td>Seminar F,W [0.25]</td>
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<td>All graduate students present a departmental seminar on their research proposal no later than the second semester. Each student is expected to participate in the seminars of colleagues and faculty. Restriction(s): Restricted to thesis-based students</td>
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<tr>
<td>PLNT*6450</td>
<td>Plant Agriculture International Field Tour U [0.25]</td>
<td></td>
<td>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<em>4260 if PLNT</em>6450 is field tour to mid-west USA</td>
</tr>
<tr>
<td>PLNT*6800</td>
<td>Special Topics in Plant Science U [0.50]</td>
<td></td>
<td>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 will be offered according to demand.</td>
</tr>
</tbody>
</table>
Political Science

Administrative Staff

Chair
Byron M. Sheldrick (525 MacKinnon, Ext. 56503)
sheldr@uoguelph.ca

Graduate Coordinator (effective July 1, 2012)
David MacDonald (508 MacKinnon, Ext. 58049)
dmacdo03@uoguelph.ca

Graduate Secretary
Renee Tavasci (527 MacKinnon, Ext. 56973)
rtavasci@uoguelph.ca

Graduate Faculty

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

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

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

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

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

Craig A. Johnson
BA Queen's, MA Toronto, PhD London School of Economics - Associate Professor and Graduate Co-ordinator

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

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

Maureen Mancuso
BA McMaster, MA Carleton, DPhil Oxford - Professor, Provost and Vice-President Academic

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

Judith McKenzie
BES Waterloo, MA, PhD Toronto - Associate Professor

Troy Riddell
BA, MA Calgary, PhD McGill - Associate Professor

Byron M. Sheldrick
BA Carleton, LLB Toronto, MA, PhD York - Associate Professor

Julie Simmons
BA British Columbia, MA, PhD Toronto - Assistant Professor

Tamara Small
BA Guelph, MA Calgary, PhD Queen's - Assistant Professor

Ian S. Spears
BA Toronto, MA Queen's, PhD McGill - Associate Professor

Adam Sneyd
BA Queen's, MA York, PhD McMaster - Assistant Professor

MA Program

The Department of Political Science offers three programs of study leading to the MA degree. Graduate students in the Department of Political Science are accepted into one of the following programs: 1) the General MA in Political Science; 2) the Collaborative MA Program in International Development Studies (CIDS); or 3) the Guelph-McMaster Collaborative MA Program in Public Policy and Administration (The G-M Program). Each of these MA programs has separate course requirements. Students in the General MA and Collaborative MA Program in International Development Studies may pursue a thesis option or a major research paper option, both of which are research-based. Students in the G-M Program are required to undertake a major research paper. The MA program can be completed in three semesters.

Application Procedure

All students must apply directly to the Department of Political Science. Graduate students are admitted each fall semester. Program offices should be consulted for admission deadlines. All applications must be submitted on-line. Complete instructions can be found at http://www.uoguelph.ca/graduates/apply

A Statement of Interest forms a vital component of the application package (see website above). A Statement of Interest should include a clear delineation of the student’s research topic, preferably a specific research question and the problem this question addresses within the academic literature.

NOTE: This is a self-administered application process. Please have all materials (reference letters, transcripts, application form, statement of research) returned to you and send materials in one envelope to the Graduate Secretary, Department of Political Science.

Admission Requirements

The department requires an Honours BA degree (4 years) in political science (or its equivalent) with at least a 'B+' average for consideration for admission to the program. A methodology course equivalent to The Systematic Study of Politics, POLS*3650, in the Department of Political Science undergraduate program, is necessary for admission to the graduate program. Students not satisfying this requirement may be admitted with the provision that it be satisfied by completing the requisite extra course.

Degree Requirements

Departmental Program - Guelph MA Program in Political Science

The University of Guelph’s Department of Political Science has a large, academically diverse research-oriented faculty. We offer strong scholarly representation in two main fields: Governance and Public Policy; and Comparative Politics. Within these two fields, the faculty’s research and supervisory expertise further is concentrated in, but not limited to, the following thematic areas: Social Policy; Environmental Policy; International Trade Policy; Criminal Justice Policy; Politics of Development; and Women, Gender and Politics. The program’s structure and the diverse interests of its members have resulted in a very broad range of course offerings. Graduates of the General MA in Political Science are engaged in a wide range of careers in academia, government and industry. In order to fulfill the requirements of the General MA Political Science, students must complete the requirements of either the thesis or the major paper options.

Thesis Option

In order to satisfy the degree requirements, the student will complete five courses plus a Pro-Seminar and a thesis, as described below for a total of 2.75 credits.

One professional development and orientation course:
POLS*6900 [0.25] Pro-Seminar

One methodology course:
POLS*6940 [0.50] Qualitative Research Design and Methods

One core course:
POLS*6600 [0.50] Comparative Approaches to Political Science

Three departmental courses, or, in consultation with the graduate advisor, courses outside the department. With the permission of the Graduate Coordinator, complete and successfully defend a thesis of no more than 20,000 words.

Major Research Paper Option

In order to satisfy the degree requirements, the student will complete six courses plus a Pro-Seminar and two course equivalents of major paper research, as described below, for a total of 4.25 credits.

One professional development and orientation course:
POLS*6900 [0.25] Pro-Seminar

One methodology course:
POLS*6940 [0.50] Qualitative Research Design and Methods

One core course:
POLS*6600 [0.50] Comparative Approaches to Political Science

Four departmental courses, or, in consultation with the graduate advisor, courses outside the department. With the permission of the Graduate Coordinator, graduate students complete and successfully defend a Major Research Paper of approximately 10,000 words.

Interuniversity MA Program - Guelph-McMaster Collaborative MA Program in Public Policy and Administration

The collaborative program in public policy and administration is an initiative on the part of the Departments of Political Science at the University of Guelph and McMaster University to co-ordinate their involvement in this particular field. The program successfully melds policy studies and administrative studies into a unique program of study in Canada. Students can avail themselves of core courses that may be offered at either institution. Up to 50% of courses can be taken at each university. The program term is one year. All the courses are grounded within the discipline of political science, while giving attention and regard to the contribution of related disciplines - such as economics, law and sociology. Graduates enjoy successful careers in the public services of Canada, Ontario and other provinces, as well as local governments, and pursue careers in the private sector as well as the non-profit sector. A number of graduates have pursued PhDs and now teach in universities and colleges.

Course of Study

The Fall and Winter semesters are devoted to completing the course requirements: four core courses and 2 specialized electives. The Summer semester differs for students who are formally enrolled at Guelph and those formally enrolled at McMaster.
Degree Requirements
In order to satisfy the degree requirements, the student will complete six courses plus a Pro-Seminar and two course equivalents of major paper research as described below for a total of 4.25 credits.

One professional development and orientation course:

POLS*6900 [0.25] Pro-Seminar

One methodology course:

POLS*6940 [0.50] Qualitative Research Design and Methods

Three core courses:

POLS*6950 [0.50] Specialized Topics in Political Studies
POLS*6630 [0.50] Approaches to Public Policy
POLS*6640 [0.50] Canadian Public Administration: Public Sector Management

Two departmental courses offered at the University of Guelph or McMaster University. With the permission of the Graduate Committee, graduate students can complete and successfully defend a Major Research Paper of approximately 10,000 words:

POLS*6970 [1.00] Major Paper

Interdepartmental MA Programs - Collaborative International Development Studies MA/MSc Program
The Department of Political Science participates in the MA Collaborative International Development Studies (CIDS) program. Please consult the International Development Studies listing for a detailed description of the MA collaborative program including the special additional requirements for each of the participating departments. CIDS graduates hold positions in government in Canada and abroad with NGOs, international organizations and private consultancies. Many also enter PhD programs.

Degree Requirements
In order to fulfill the requirements of the CIDS MA, students must complete the requirements of either the thesis or the major research paper options.

Thesis Option
In order to satisfy the degree requirements, the student will complete seven courses plus a Pro-Seminar and a thesis, as described below for a total of 3.75 credits.

One professional development and orientation course:

POLS*6900 [0.25] Pro-Seminar

One methodology course:

POLS*6940 [0.50] Qualitative Research Design and Methods

or an equivalent from another department.

One core course:

POLS*6730 [0.50] The Politics of Development and Underdevelopment
Five CIDS core courses (2.50). See the Collaborative International Development Program entry in this calendar. POLS*6730 will count as both a Political Science requirement and a CIDS requirement. With the permission of the Graduate Committee, graduate students may complete and successfully defend a thesis of no more than 20,000 words.

Major Research Paper Option
In order to satisfy the degree requirements, the student will complete eight courses plus a Pro-Seminar and two course equivalents of major paper research as described below for a total of 5.25 credits.

One professional development and orientation course:

POLS*6900 [0.25] Pro-Seminar

One methodology course:

POLS*6940 [0.50] Qualitative Research Design and Methods

or an equivalent from another department.

One core course:

POLS*6730 [0.50] The Politics of Development and Underdevelopment
Five CIDS core courses (2.50). See the Collaborative International Development Program entry in this calendar. POLS*6730 will count as both a Political Science requirement and a CIDS requirement. With the permission of the Graduate Committee, graduate students may complete and successfully defend a Major Research Paper of approximately 10,000 words.

POLS*6970 [1.00] Major Paper

PhD Program
The PhD program offers students the opportunity to pursue studies in two fields: Comparative Politics, and Public Policy and Governance. Students are required to major in one field and minor in the other. Within Comparative Politics, students can focus their studies thematically or regionally. The department has expertise in developing, transitional, and advanced-industrial countries. Within the field of Public Policy and Governance students will pursue studies in a wide range of areas, including health care, law, criminal justice, environmental policy, social policy, security policy, trade policy, federalism and intergovernmental relations, and multilevel governance.

Application Procedure
All students must apply directly to the Department of Political Science. Graduate students are admitted each Fall semester. Program offices should be consulted for admission deadlines. All applications must be submitted on-line. Complete instructions can be found at http://www.uoguelph.ca/graduatestudies/apply

A Statement of Interest forms a vital component of the application package (see website above). A Statement of Interest should include a clear delineation of the student’s research topic, preferably a specific research question and the problem this question addresses within the academic literature.

NOTE: This is a self-administered application process. Please have all materials (reference letters, transcripts, application form, statement of research) returned to you and send materials in one envelope to the Graduate Secretary, Department of Political Science.

Admission Requirements
Students are expected to have completed an MA in Political Science with at least an A-average for consideration for admission to the program. Students are also required to have successfully completed a graduate course in quantitative and qualitative Political Science methods. Students not satisfying this requirement may be admitted with the provision that it be satisfied by completing the requisite extra course. Students with a MA in a Social Science other than Political Science, are encouraged to apply on the condition that they take additional courses upon their entry into the program.

Degree Requirements
Students will be required to successfully complete a minimum of four graduate courses:

• Two PhD core courses (see Department’s Graduate Handbook in the student’s major field and minor field (selected in consultation with the student’s Advisor)

• Two of the following courses as electives:

  i. One or two of the other existing graduate courses offered in the Department

  ii. A graduate course offered in another department at the University of Guelph

• A written qualifying exam and an oral qualifying exam.

  The qualifying examination will take the form of a written take-home examination followed by an oral examination and will be based on the reading lists for the core courses in the major and minor field. Normally the examination will involve three questions based on the major field of study and two questions from the minor field.

• A thesis

  Each candidate will be required to write and submit a thesis on the research carried out by the candidate on a topic approved by the Advisory Committee. The thesis is expected to be a significant contribution to knowledge in its field and the candidate must indicate in what ways it is a contribution. A thesis is expected to be no less than 200 pages in length. The thesis must demonstrate mature scholarship and critical judgement on the part of the candidate, and it must indicate an ability to express oneself in a satisfactory literary style. Approval of the thesis is taken to imply that it is judged to be sufficiently meritorious to warrant publication in reputable scholarly media in the field.

Interdepartmental Programs

International Development Studies MA Program
The Department of Political Science participates in the collaborative MA in International Development Studies (IDS) program. Please consult the International Development Studies listing for a detailed description of the collaborative MA program 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.

International Development Studies PhD Program
The Department of Political Science participates in the collaborative PhD 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. More information about the requirements and expectations of the IDS PhD program please consult the International Development Studies listing.

Rural Studies PhD Program
The Department of Political Science is a participant in the PhD program in Rural Studies in the field of sustainable rural communities. PhD students will enroll in the interdepartmental rural studies program; those with advisors in the Department of Political Science will have access to departmental facilities. Please consult the Rural Studies listing for a detailed description of this program.

Courses

| POLS*6000 Comparative Approaches to Political Science U | 0.50 |

In this course, the students examine the main theoretical frameworks and debates in political science and the ways in which these conceptual approaches guide empirical analysis and explain political behaviour. Examples include neo-institutionalism, political culture, Marxism, feminist and identity based approaches.
POLS*6050 Gender and Politics U [0.50]
This course will survey theoretical approaches to gender, primarily feminist analysis. Through selected readings, students will be introduced to gender as an approach to examining current political problems such as social policy, security or development.

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.

POLS*6250 Comparative Governments in the Americas U [0.50]
This course provides the theoretical and methodological foundation for the analysis of Canada, the United States, and Latin America and the Caribbean. Methodological issues in the analysis of constitutional regimes and theoretical frameworks for the comparative analysis of political institutions are examined.

POLS*6290 The American Political System U [0.50]
This course examines the institutions, processes and policies of the government and politics of the United States. Seminar discussion focuses on evaluating approaches to the study of the American system. Topics to be covered include Congress, interest groups, executive-legislative relations and reinventing government.

POLS*6380 Democratization in Comparative Perspective U [0.50]
This course offers a graduate seminar in the study of democratization. Focusing primarily on the countries of the Global South, it explores theories of democratic transition, social mobilization and the articulation of rights aimed at defending new forms of democratic recognition.

POLS*6390 Environmental Politics and Policy U [0.50]
This course analyses environmental actors, movements, institutions, processes and policies across national, sub-national regional and/or global levels of governance utilizing a range of environmental perspectives and theories. Depending on the instructor(s), different case studies of critical and contemporary environmental policy issues will be explored.

POLS*6400 Comparative Social Policy U [0.50]
In this course, students will study social policy in comparative perspective. Theoretical models and various policy fields will be examined in order to understand welfare state development and reconfiguration. Policy fields may include immigration, health, child care and income.

POLS*6450 International Political Economy U [0.50]
The course relies on theoretical approaches in IPE to examine the relationships between politics and economics across national and regional levels. The evolution of the global political economy and its globalization and state and non-state actors' responses. Issue areas may include: money and power, technology, trade, development and the environment.

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.

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.

POLS*6730 The Politics of Development and Underdevelopment U [0.50]
This course, for MA students specializing in international and comparative development, has a primarily theoretical orientation, focusing on the main paradigms that have evolved to explain central problems and issues of development and underdevelopment, particularly modernization theory, dependency theory, world-systems theory and Marxist state-theory.

POLS*6750 Development in Practice U [0.50]
This course examines the politics of international development policy and practice. Drawing upon theories of development and underdevelopment, it examines the role of transnational regimes, international institutions, national governments, and NGOs in the provision of international development assistance.

POLS*6800 Public Policy and Governance - Selected Topics F [0.50]
This course explores concepts, theories and methods of public policy analysis and governance practices and questions; the factors that influence a state's ability to design, coordinate, implement and learn from policy interventions; the intellectual forces and conceptual-theoretical frameworks that underpin the literature.

Restriction(s): Doctoral students only.

http://www.mcmaster.ca/graduate/calendar.html

Courses at McMaster University available to students in the collaborative MA program

Descriptions of all McMaster University Graduate courses may be found at http://www.mcmaster.ca/graduate/calendar.html
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.

Our research mission is to discover and disseminate knowledge regarding the management of health and productivity of animal populations, and the interrelationships of animals with humans and the environment. In support of this mission we rely principally on our expertise in field-based quantitative observational studies and clinical trials.

Our teaching/learning mission is to guide students as they obtain an essential knowledge base and develop the necessary communicative, quantitative and problem-solving skills to integrate and apply this knowledge; and to instill the appropriate attitudes and abilities required for life-long learning.

The department offers programs leading to MSc, Master of Public Health (MPH), PhD and DvSc degrees.

### Administrative Staff

**Chair**
Catherine E. Dewey (2509 OVC, Ext. 54746)
cdewey@ovc.uoguelph.ca

**Graduate Coordinator, Admissions and Administration**
David Kelton (Stewart Bldg. 2537 OVC, Ext. 54808)
dkelton@uoguelph.ca

**Graduate Coordinator, Exams**
Olaf Berke (Stewart Bldg. 2505B OVC, Ext. 58924)
oberke@uoguelph.ca

**Graduate Secretary**
Sandra Wolting (CLRE 102 OVC, Ext. 54780)
wolting@ovc.uoguelph.ca

**Graduate Faculty**

#### Kenneth G. Bateman
DVM, MSc Guelph - Associate Professor

#### Olaf Berke
Dipl. Statistics, PhD Dortmund Germany - Associate Professor and Graduate Coordinator, Exams

#### Tracey S. Chenier
DVM, DVS Guelph, Dip ACT - Assistant Professor

#### Jason Coe
DVM, PhD Guelph - Assistant 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

#### Michele Guerin
DVM, MSc, PhD Guelph - Assistant Professor

#### Derek Haley
BHK Windsor, MSc Guelph, PhD Saskatchewan - Assistant Professor

#### Andria Jones
DVM, PhD Guelph - Assistant Professor

#### David F. Kelton
DVM, MSc, PhD Guelph, Dip ABVP - Professor and Graduate Coordinator, Admissions and Administration

#### Stephen LeBlanc
BSc McGill, DVM, DVS Guelph - Associate Professor

#### Kerry D. Lissemore
BSc Toronto, DVM, DVS Guelph - Associate Professor and Associate Dean, Academic

#### Scott A. McEwen
DVM, DVS Guelph, Dip, ACVP - Professor

#### Michael Meehan
BVS, BSc, PhD University of Queensland - Assistant Professor

#### Paula L. Menzies
DVM Guelph, MPVM California - Associate Professor

#### Lee Niel
BSc Simon Fraser, PhD UBC - Assistant Professor

#### Andrew Papadopoulos
BSc Ryerson, MBA York, PhD Guelph - Associate Professor and Coordinator, Master of Public Health Program

#### David Pearl

### Degree Requirements

#### MSc Program

The department offers research-based MSc programs in epidemiology, theriogenology, health management and a course work-based MSc program in epidemiology.

#### Admission Requirements

When reviewing transcripts, the department focuses on the applicant's performance in undergraduate and graduate-level courses relevant to the applicant's proposed area of specialization. Students admitted must have an honours or DVM degree (or its equivalent). In addition, the department considers the applicant's special circumstances and the referees' comments. Since the core of the course work MSc program builds on analytic skills, students entering the program should possess knowledge of basic statistical methods and their application.

All applicants should submit a one-page statement of research interests and career goals to assist in the identification of a faculty advisor who has the funding necessary to support the research. Students may be admitted into the Fall, Winter or Summer semesters.

### MSc in Epidemiology by Courses

For the MSc in Epidemiology by course work and project, no fewer than eight courses (at least 4.0 course credits) will be taken. These must be approved by the departmental graduate studies committee and the Assistant VP of Graduate Studies. Each student in the program will take three prescribed courses (including the Project in Epidemiology course, POPM*6250, which is equivalent to two courses), and at least four additional courses. The department seminar course, POPM*6100, is also required but does not count as one of the four courses. A thesis must be completed and successfully defended.

#### Prescribed Courses:

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<thead>
<tr>
<th>Course</th>
<th>Credit</th>
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<tbody>
<tr>
<td>POPM*6210</td>
<td>0.50</td>
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<tr>
<td>POPM*6250</td>
<td>1.00</td>
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#### 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:

<table>
<thead>
<tr>
<th>Course</th>
<th>Credit</th>
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<tbody>
<tr>
<td>PABI*6550</td>
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<tr>
<td>POPM*6230</td>
<td>0.50</td>
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<tr>
<td>POPM*6290</td>
<td>0.50</td>
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<tr>
<td>POPM*6350</td>
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<tr>
<td>POPM*6905</td>
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<tr>
<td>STAT*6920</td>
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<tr>
<td>POPM*6520</td>
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<tr>
<td>POPM*6700</td>
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<tr>
<td>POPM*6400</td>
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<tr>
<td>STAT*6900</td>
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</tbody>
</table>

Additional courses other than those listed above may be deemed suitable for the student's program by the Departmental Graduate Coordinator after recommendations are received from the Advisory Committee.

At least three semesters of full-time study will be required for completion of the course work MSc program; 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 available in epidemiology. Admission into this program is usually granted to holders of an MSc degree who have demonstrated superior performance, or to MSc students who have completed their thesis but have performed exceptionally well in courses, shown exceptional aptitude and skill in research, and whose thesis research is suitable for expansion to the doctoral level. For direct transfer, a thesis proposal and strongly supportive letters of reference are required. Infrequently, well qualified DVM or honours degree holders may be accepted directly into the PhD program.

All applicants should submit a one-page statement of research interests and career goals to assist in the identification of a faculty advisor who has the funding necessary to support the thesis research. Students may be admitted into the Fall, Winter or Summer semesters.

**Degree Requirements**

The major emphasis in the PhD program is on the preparation of an acceptable thesis. There are no specific course requirements other than the Seminar, POPM*6100, which must be completed twice. However, students are expected to have taken POPM*6200 Epidemiology I (F) and POPM*6210 Epidemiology II, or their equivalent, in their MSc program. 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. MSc holders must complete the qualifying examination by the end of the fifth semester. Students transferring from the MSc program and those who enter the program directly after their honours or DVM degrees (or their equivalents) must complete the examination by the end of the seventh semester. In addition, the advisory committee is required to confirm that the student has demonstrated ability and promise in research. The PhD program is completed by the successful defence of a thesis.

**DVSc Program**

The Department of Population Medicine participates in the DVSc program with recognized fields in health management and theriogenology. The normal basis for admission to the DVSc studies as a regular or a provisional student in a DVM or equivalent degree 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 second-class honours ("B" standing), 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 and successful defense 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 second-class honours ("B" standing), and eligibility for licensure to practice veterinary medicine in Ontario. The DVSc program provides rigorous advanced academic preparation in the discipline of Theriogenology with a view to preparation for Board Certification by the American College of Theriogenologists. The Theriogenology field at the Ontario Veterinary College is multi-species, with emphasis placed on a candidate’s specific areas of interest. The DVSc differs from PhD training by emphasizing the development of both research and applied clinical skills. It is a three-year program, with approximately one-third of the time involving clinical duties within the Veterinary Teaching Hospital, including assisting in teaching of final year veterinary students. The remainder of effort is directed towards a substantive thesis research project in Theriogenology and coursework. The DVSc degree requirements include successful completion of 2.5 credits of prescribed graduate level courses, a qualifying examination and successful defense of a thesis. A faculty member(s) in the Department of Population Medicine will supervise each candidate for the Theriogenology DVSc position.

**Interdepartmental Programs**

**Food Safety and Quality Assurance MSc**

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 Programs**

**International Development Studies MSc**

The Department of Population Medicine participates in the International Development Studies MSc program. Those faculty members whose research and teaching expertise includes aspects of international studies may serve as advisors for MSc in International Development Studies students. Please consult the International Development Studies listing for a detailed description of the collaborative program.

**Neuroscience MSc**

The Department of Population Medicine participates in the Neuroscience MSc program. Those faculty members whose research and teaching expertise includes aspects of neuroscience may serve as advisors for MSc in Neuroscience students. Please consult the Neuroscience listing for a detailed description of the collaborative program.

**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. All others must obtain instructor's signature.

- **POPM*6210 Epidemiology II W [0.50]**

  Advanced study design and analytic methods for the analysis of data from observational studies and surveys.

- **POPM*6220 Analytical Epidemiology S [0.50]**

  This course focuses on the advanced analysis of epidemiologic studies. Case control, cohort and survival studies are analysed within the generalized linear-model framework. Links between study objectives, study design and data analysis will be emphasized throughout. Special problems, such as the analysis of correlated data arising from cluster sampling of individuals, are discussed.

  **Prerequisite(s):** POPM*6210 and POPM*6290.

- **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.

- **POPM*6250 Project in Epidemiology S [1.00]**

  Collection and analysis of field data and the preparation of a written report suitable for publication, and oral presentation of the findings to the graduate faculty. This course is part of the MSc program by course work in epidemiology.
### IX. Graduate Programs, Population Medicine

**POPM*6290 Statistics for the Health Sciences F [0.50]**
This course gives an overview of advanced methods for the analysis of data of clustered/correlated data. Special emphasis is on spatial, longitudinal and survival data.

*Prerequisite(s): POPM*6210 (or equivalent graduate course from another university)*

**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*

#### 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.

**POPM*6700 Swine Health Management * U [0.50]**
Diseases of swine are studied with particular emphasis on preventive medicine and herd-health management.

#### 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.

**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.

**POPM*6650 Theriogenology of Dogs and Cats * U [0.50]**
A seminar/lecture series that includes the theory and management of clinical reproduction for the dog and cat, including use of developing technologies.

**POPM*6670 Theriogenology of Small Ruminants * U [0.50]**
A seminar/laboratory course emphasizing advanced reproductive management of sheep, goats and farmed deer/elk, with the emphasis on a sheep production model. New reproductive technologies will be included.

#### Other

**POPM*6100 Seminar F [0.00]**
A practical course that utilizes tutorials, workshops, self and peer reviewed assessment to help participants develop skills in public speaking and presentation of scientific data. Each student presents at least one seminar on an approved subject during the departmental seminar series.

**POPM*6950 Studies in Population Medicine U [0.50]**
Assigned reading and/or special projects selected to provide in-depth study of topics appropriate to the specialized interests of individual students. Courses offered under this title have included Special Topics in Public Health; Ecology and Health; Systems Approaches; and Animal Welfare. Different offerings are assigned different section numbers.

#### Public Health

**POPM*6350 Safety of Foods of Animal Origins F [0.50]**
The detection, epidemiology, human health risk, and control of hazards in food of animal origin.

*Restriction(s): Offered by distance education only.*

**POPM*6510 Community Health Promotion F [0.50]**
The objective of this course is to provide students with an understanding of public health, population health and health promotion. Topics will include perspectives on health and illness, injury prevention, determinants of health, population diversity and the role of evidence in public health decision-making.

**POPM*6530 Communication I W [0.50]**
This course introduces the theory of public health communication and emphasizes the development of communication skills related to public health.

*Restriction(s): MPH students. All others must obtain instructor’s signature.*

**POPM*6540 Concepts in Environmental Public Health W [0.50]**
This course covers the main concepts of environmental public health including basic elements of environmental toxicology, risk analysis, air and water quality, food safety, waste, occupational health and eco health.

**POPM*6550 Public Health Policy and Systems W [0.50]**
This course covers concepts and principles of public health policy and systems including: public health systems, their structure, funding and governance and their integration into the healthcare system; evolution of public health policy; models of policy development and analysis; stakeholder analysis; and, public health ethics.

**POPM*6560 Public Health Practicum U [1.00]**
In this 1.0 credit course, students will synthesize theoretical concepts, learned via prior coursework, with public health practice. Students will work in a host public health agency for a 12-to 16-week period, focusing on a major project of significance to the host organization.

*Prerequisite(s): POPM*6200, POPM*6510, POPM*6520, POPM*6530, POPM*6540, and POPM*6550*  
*Restriction(s): MPH students only. All others instructor’s signature required.*

**POPM*6570 Communication II F [0.50]**
This course is a capstone course for the MPH program as students reflect on, interpret and present their practicum experience in a variety of formats. The course also focuses on the practice of public health communication, including ethical considerations, message framing and the development of a public health communication campaign.

*Prerequisite(s): POPM*6560 or instructor’s signature required*

**POPM*6580 Public Health Administration F [0.50]**
This course will teach students to develop, implement and evaluate public health programs. Knowing an organization’s mission and priorities, developing strategic plans and conducting a cost-benefit analysis is critical for an effective administrator. Furthermore, conducting a program evaluation, understanding the role of advocacy is vital.
**Psychology**

The Department of Psychology offers three graduate degrees, a Master of Arts, a Master of Science and a Doctor of Philosophy. The first is an MA in: 1) Applied Social Psychology, 2) Clinical Psychology: Applied Developmental Emphasis and 3) Industrial/Organizational Psychology. The second is an MSc in: 1) Neuroscience & Applied Cognitive Science. The third is a PhD in: 1) Applied Social Psychology, 2) Clinical Psychology: Applied Developmental Emphasis, 3) Industrial/Organizational Psychology and 4) Neuroscience & Applied Cognitive Science. 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](http://www.psychology.uoguelph.ca) for additional information.

**Administrative Staff**

Chair  
Mary Ann Evans (4013 MacKinnon, Ext. 53080)  
evans@psy.uoguelph.ca

Graduate Coordinator  
Lana Trick (4003 MacKinnon, Ext. 53518)  
trick@psy.uoguelph.ca

Graduate Secretary  
Robin Fraser (4014 MacKinnon, Ext. 53508)  
rfraser@psy.uoguelph.ca

**Graduate Faculty**

Nassem Al-Aidroos  
BSc Waterloo, MA, PhD Toronto - Assistant Professor

Heidi N. Bailey  
BA British Columbia, PhD Western - Associate Professor

Paula Barata  
BA British Columbia, MA, PhD Windsor - Assistant Professor

Pat Barclay  
BSc Guelph, PhD McMaster - Assistant Professor

Roderick W. Barron  
BA Occidental, MA, PhD Ohio State - Professor

Elena Choleris  
BSc, PhD Parma (Italy) - Professor

Donald Dedrick  
BA, MA Carleton, PhD Toronto - Associate Professor, (cross-appointed with Department of Philosophy)

Serge Desmarais  
BA, MA, PhD Waterloo - Professor, Canada Research Chair, Associate Vice-President (Academic)

Mary Ann Evans  
BA Toronto, MA, PhD Waterloo - Professor and Chair

Mark J. Fenske  
BSc Lethbridge, MA, PhD Waterloo - Associate Professor

Harjinder Gill  
BA Waterloo, MA, PhD Western Ontario - Associate Professor

Gloria Gonzalez-Morales  
BA La Laguna, DIPL, PhD Valencia - Assistant Professor

Benjamin H. Gottlieb  
AB, MSW, PhD Michigan - Professor

Michael P. Grand  
BA Toronto, PhD SUNY at Stony Brook - Professor

Peter A. Hausdorf  
BSc McMaster, MA Guelph, PhD McMaster - Associate Professor and Associate Chair

Karl H. Hennig  
BEd, MA, PhD British Columbia - Assistant Professor

Francesco Leri  
BA, MA, PhD McGill - Associate Professor

Stephen Lewis  
BSc, PhD Dalhousie - Assistant Professor

Margaret N. Lumsley  
BA Waterloo, MA, PhD Queen's - Associate Professor

Harvey H.C. Marmurek  
BA Toronto, MA, PhD Ohio State - Professor

C. Meghan McMurry  
BA Laurier, PhD Dalhousie - Assistant Professor

Daniel V. Meegan  
BA SUNY at Albany, PhD McMaster - Associate Professor

Barbara A. Morrongiello  
BA Douglass College (Rutgers), MS, PhD Massachusetts - Professor, Canada Research Chair

Ian R. Newby-Clark  
BSc Toronto, PhD Waterloo - Associate Professor

Kieran O'Doherty  
BSc Witwatersrand, BHSc, PhD Adelaide - Assistant Professor

Linda A. Parker  
BA, MA California State, Long Beach PhD Memorial - Professor, Canada Research Chair

Deborah Powell  
BA Queen's, MA, PhD Western - Assistant Professor

Saba F. Safdar  
BA McMaster, MA, PhD York - Associate Professor

Leanne S.M. Son Hing  
BA Queen's, MA, PhD Waterloo - Associate Professor

Jeffrey Spence  
BA Laurier, MA, PhD Waterloo - Assistant Professor

David Stanley  
BA Waterloo, MA, PhD Western Ontario - Associate Professor

Lana M. Trick  
BSc Calgary, MA, PhD Western Ontario - Associate Professor and Graduate Coordinator

Boyer D. Winters  
BA Dalhousie, PhD Cambridge - Associate Professor

**Neuroscience and Applied Cognitive Science (MSc, PhD)**

[http://www.uoguelph.ca/nacs](http://www.uoguelph.ca/nacs)

The Masters and PhD programs in the areas of Neuroscience and Applied Cognitive Science provides training for students interested in the integrative functioning of the brain. This program encompasses: basic cognitive processes, behaviourial 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. As well, the department of Psychology (and specifically the Neuroscience and Applied Cognitive Science area of Psychology) participates in the Collaborative Neuroscience and Collaborative Toxicology programs. That means that students in the Neuroscience and Applied Cognitive Science area have 3 alternatives for their degree. They can elect to register in Psychology alone, Psychology and Collaborative Neuroscience, or Psychology and Collaborative Toxicology. (Note that students cannot register in both the Collaborative Toxicology and Collaborative Neuroscience Programs.)

**The program involves three components:**

1. **Preparatory Course Work**

   Students will acquire knowledge and skills necessary to carry our Neuroscience and Cognitive Science research in academic and/or applied settings. At the Masters level, this will involve a course in Research Design and Statistics, a course in Research Ethics (Animal research ethics or Human research ethics), at least one elective in their specific field of research and the Research Seminar in Neuroscience and Applied Cognitive Science A. PhD students take Research Seminar in Neuroscience and Applied Cognitive Science B, at least three electives and must pass a qualifying exam.

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. PhD students may take one or more practicums as part of their electives.

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 and a Dissertation for the PhD.
Applied Social Psychology (MA, PhD)

Applied Social Psychology is based on the investigation of social processes and problems of significance to the general community and to specific groups. Areas of investigation may include, but are not limited to, aging, ethics, health, policy, equity, community services, the environment, ethnicity, and gender. Diverse research strategies, including qualitative and quantitative methods, are used to answer questions related to social issues. Graduate study in Applied Social Psychology is designed to prepare students for academic and applied research careers in a wide range of settings. The graduate program has two emphases: (1) the pursuit of advanced research, and (2) the design and evaluation of programs that aim to reduce social problems and promote human welfare.

Clinical Psychology: Applied Developmental Emphasis (MA, PhD)

The area of Clinical Psychology: Applied Developmental Emphasis concentrates on understanding the development and treatment of psychological disorders experienced by children, youth, and families. This includes a focus on the social, emotional, cognitive, and neurobiological features of normal and atypical development; risk and protective factors that influence the nature and progression of atypical development and response to treatment; and approaches to assessment, psychodiagnosis, and intervention. Also considered is the developmental impact of stressful life events such as divorce, illness, poverty, adoption, and death. Training in this field follows an integrated series of courses and practica which contributes to and mutually supports the students' acquisition of competence as both practitioners and researchers. Students participate in our on-campus clinic, the Centre for Psychological Services, and complete off campus practica in hospitals, schools and mental health centres. 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.

General Admission and Program Requirements

To apply for admission, applicants must view "How to Apply" in the section Prospective Students... Graduate, in the Psychology Department website http://www.psychology.uoguelph.ca. This is a self-administered application. First, students apply online through the Ontario Universities Application Centre (OUAC) and pay an application fee. Second, they assemble the application information described in the psychology website consisting of Letter of Reference forms, all post secondary transcripts, a Departmental Questionnaire, and a copy of the online OUAC application form and forward the complete package to the Graduate Secretary, Department of Psychology, University of Guelph, Guelph, Ontario Canada N1G 2W1. Detailed application instructions, including field specific admission deadlines and Graduate Record Examination (GRE) requirements, can be found at: http://www.uoguelph.ca/psychology/page.cfm?id=699

MA Program

Admission Requirements MA Program

Consideration for admission to the MA program in the areas of Applied Social Psychology, Clinical Psychology: Applied Developmental Emphasis, or Industrial/Organizational Psychology will be given to students with an honours BA or BSc (or its equivalent) in Psychology and a minimum of a B+ standing. Students are normally expected to have taken courses across the breadth of psychology with some courses in the area to which they are applying. A strong background in methodology and statistics is expected. As well, applicants must have undertaken an Honours thesis research project or senior research project equivalent. Students are admitted to the MSc program with the understanding that they intend to proceed to the PhD program.

Degree Requirements MA Program

Applied Social Psychology

<table>
<thead>
<tr>
<th>Course Code</th>
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*The following electives are required: (1) 1 of the above; (2) 1 of the following: PSYC*6720, PSYC*6730, PSYC*6740, PSYC*6750, PSYC*6760, PSYC*6770, PSYC*6780. A maximum of 2 electives from the above can be taken. In addition, students must also take at least 1 of the following electives: PSYC*6790, PSYC*6791, PSYC*6792. In no case may students take more than one course from these electives.*

and one elective course to be determined in consultation with the student's MA Advisory Committee, and MA Thesis.

Clinical Psychology: Applied Developmental Emphasis

<table>
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<tr>
<th>Course Code</th>
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<td>PSYC*6660</td>
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<tr>
<td>PSYC*6690</td>
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<td>PSYC*6700</td>
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*The following electives are required: (1) 1 of the above; (2) 1 of the following: PSYC*6720, PSYC*6730, PSYC*6740, PSYC*6750, PSYC*6760, PSYC*6770, PSYC*6780. A maximum of 2 electives from the above can be taken. In addition, students must also take at least 1 of the following electives: PSYC*6790, PSYC*6791, PSYC*6792. In no case may students take more than one course from these electives.*

and one elective course to be determined in consultation with the student's MA Advisory Committee, and MA Thesis.

Industrial/Organizational Psychology

<table>
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*The following electives are required: (1) 1 of the above; (2) 1 of the following: PSYC*6720, PSYC*6730, PSYC*6740, PSYC*6750, PSYC*6760, PSYC*6770, PSYC*6780. A maximum of 2 electives from the above can be taken. In addition, students must also take at least 1 of the following electives: PSYC*6790, PSYC*6791, PSYC*6792. In no case may students take more than one course from these electives.*

MSc Program

Admission Requirements MSc Program

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. Computer science, neuroscience) and a minimum of a B+ standing. Students are normally expected to have taken courses across the breadth of psychology with some courses in the area to which they are applying. A strong background in methodology and statistics is expected. As well, applicants must have undertaken an Honours thesis research project or senior research project equivalent. Students are admitted to the MSc program with the understanding that they intend to proceed to the PhD program.

Degree Requirements MSc Program

Neuroscience and Applied Cognitive Science

<table>
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<th>Course Code</th>
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<tr>
<td>PSYC*6700</td>
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<tr>
<td>PSYC*6710</td>
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</tbody>
</table>

*The following electives are required: (1) 1 of the above; (2) 1 of the following: PSYC*6720, PSYC*6730, PSYC*6740, PSYC*6750, PSYC*6760, PSYC*6770, PSYC*6780. A maximum of 2 electives from the above can be taken. In addition, students must also take at least 1 of the following electives: PSYC*6790, PSYC*6791, PSYC*6792. In no case may students take more than one course from these electives.*

and one elective course to be determined in consultation with the student's MA Advisory Committee, and MA Thesis.

PhD Program

Admission Requirements PhD Program

Students must have completed Masters requirements in the appropriate field of study (Neuroscience and Applied Cognitive Science; Applied Social Psychology; Clinical Psychology: Applied Developmental Emphasis; Industrial/Organizational Psychology) with a minimum 'A' standing to be eligible for admission to the PhD program. These Masters requirements are normally met within the department in a two-year course of studies comprising specified course work and a thesis. Students admitted to the PhD program who have completed MA or MSc degrees in other fields of study and/or from other universities may be required to take Masters level courses to ensure adequate background preparation for PhD work.
Degree Requirements PhD Program

Neuroscience and Applied Cognitive Science

PSYC*6760 [0.00] Research Seminar in Neuroscience and Applied Cognitive Science B

Three elective courses from the following list.

PSYC*6472 [1.00] Practicum II
PSYC*6473 [0.25] Practicum III
PSYC*6570 [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.

All students must also take the Qualifying exam and do a PhD thesis.

Applied Social Psychology

PSYC*6900 [0.50] Philosophy and History of Psychology as a Science
PSYC*6380 [0.50] Psychological Applications of Multivariate Analysis
PSYC*6522 [0.50] Research Seminar II
PSYC*6471 [0.50] Practicum I

One of:

PSYC*6270 [0.50] Issues in Social Policy

1 elective to be determined in consultation with the student’s PhD Advisory Committee; Qualifying Exam; and PhD Thesis.

Clinical Psychology: Applied Developmental Emphasis

PSYC*6580 [0.50] Models of Child and Adolescent Psychotherapy
PSYC*6670 [0.50] Research Methods
PSYC*6900 [0.50] Philosophy and History of Psychology as a Science
PSYC*6380 [0.50] Psychological Applications of Multivariate Analysis
PSYC*7070 [0.50] Psychological Measurement
PSYC*6840 [0.50] Program Evaluation
PSYC*6610 [0.50] Advanced Child and Adolescent Psychotherapy
PSYC*6800 [0.25] Legislation and Professional Practice
PSYC*6020 [0.50] Clinical and Diagnostic Interviewing Skills
PSYC*7993 [1.00] CP/AD/E Clinical Practicum III

In accordance with CPA Accreditation Standards, if student has not completed 2 senior undergraduate half courses in the social bases of behaviour, one of the following three courses is required:

PSYC*6590 [0.50] Social and Community Intervention
PSYC*6640 [0.50] Foundations of Applied Social Psychology
PSYC*6830 [0.50] Applied Social 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 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
PSYC*6800 [0.00] Clinical Internship

Industrial/Organizational Psychology

PSYC*7130 [0.50] Introduction to Industrial/Organizational Psychology (if not already taken)
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 (fall and winter 1st year PhD)

At least 1 of the following set of 3 courses:

PSYC*7010 [0.50] Recruitment and Selection: Methods and Outcomes
PSYC*7020 [0.50] Employee Performance
PSYC*7160 [0.50] Employee Development: Methods and Outcomes

At least 1 of the following set of 3 courses:

PSYC*7030 [0.50] Work Attitudes and Behaviour
PSYC*7040 [0.50] Social Processes in the Workplace
PSYC*7190 [0.50] Work Motivation and Leadership

One elective from:

PSYC*6840 [0.50] Program Evaluation

PSYC*7140 [0.50] Industrial/Organizational Psychology Special Topic
PSYC*7170 [0.50] Industrial/Organizational Psychology Doctoral Research Internship I
PSYC*7180 [0.50] Industrial/Organizational Psychology Doctoral Research Internship II

All students must also do a Qualifying exam and PhD thesis.

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.

PSYC*6190 Research Project U [1.00]
This course is an option for students in the applied streams of MA studies who do not plan on proceeding to a PhD program. Under the supervision of a faculty member, students will design and conduct an empirical investigation in their area of emphasis.

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.

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.

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.

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.

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.

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.

PSYC*6472 Practicum II U [1.00]
See PSYC*6471. Students work four to five days a week in the selected setting.

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.

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.

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.

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.
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.

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

Restriction(s): Instructor's signature required

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.

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.

PSYC*6760 Research Seminar in Neuroscience and Applied Cognitive Science B U [0.00]
This course will expose graduate students to some of the major theories, issues and methodologies driving the research broad field of Neuroscience and Applied Cognitive Science. Students will learn to critically evaluate presentations by researchers in this field as well as to communicate the results of their own research, in both a written and oral format. All second year master's and doctoral students in NACS are required to enroll in this course each fall and winter semester of their graduate program until they graduate.

PSYC*6780 Foundations of Cognitive Science U [0.50]
Cognitive Science is an inter-disciplinary field that encompasses cognitive psychology, neuroscience, philosophy, and computer science. The foundational issues and basic methodologies that define cognitive science will be discussed, with specific examples from perception, learning, memory, language, decision-making, and problem solving.

Restriction(s): Restricted to Psychology graduate students; all others by permission only

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.

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*6270 Issues in Social Policy U [0.50]
This doctoral course examines historical developments and selected contemporary policy domains in Canada. Topics may include policies affecting children, families, the elderly, First Nations people, the mentally and physically disabled, and one parent families. The course also addresses the interplay between social and psychological research and policy formation, as well as the use of social policy as an instrument of social change.

PSYC*6590 Social and Community Intervention U [0.50]
A highly applied course that focuses on the epidemiology of mental disorders, the design and implementation of preventive interventions with children, youth, and adults in the community, as well as stress and coping theory and practice.

PSYC*6640 Foundations of Applied Social Psychology U [0.50]
This course examines theory and research in social psychology, particularly in those areas most relevant to applied concerns. Topics may include attribution, attitudes, social relationships, language and communication, and self and identity.

PSYC*6830 Applied Social Psychology U [0.50]
This course reviews selected theories, methods and problem areas in applied social psychology. Issues involved in the conduct and application of social research, as well as alternative paradigms for such research, are discussed.

PSYC*6840 Program Evaluation U [0.50]
This course provides an introduction to a variety of methods of social program evaluation and to the process of consultation with program staff.

Clinical Psychology: Applied Developmental Emphasis

PSYC*6000 Developmental Psychopathology: Etiology and Assessment U [0.50]
The interaction of neurobiological, physiological, familial and social factors to an understanding of developmental psychopathology is the focus of this course. Emphasis is given to etiology and clinical assessment issues.

PSYC*6010 Learning Disorders: Research and Clinical Practice U [0.50]
This course examines various cognitive, social, and educational components of learning and language disorders and accompanying clinical methods of diagnosis and remediation.

PSYC*6020 Clinical and Diagnostic Interviewing Skills S [0.50]
This course provides practical training in clinical and diagnostic interviewing. Through role-play, direct observation, and in-vivo practice, students will learn how to conduct assessment and diagnostic interviews, and clinical dialogues with children and adults. This course is open only to graduate students in the CP:ADE field.

Prerequisite(s): Completion of all MA level course work except for the thesis

Restriction(s): Open only to graduate students in the Clinical Psychology: Applied Developmental Emphasis (CP:ADE) field

PSYC*6270 Issues in Social Policy U [0.50]
This doctoral course examines historical developments and selected contemporary policy domains in Canada. Topics may include policies affecting children, families, the elderly, First Nations people, the mentally and physically disabled, and one parent families. The course also addresses the interplay between social and psychological research and policy formation, as well as the use of social policy as an instrument of social change.

PSYC*6580 Models of Child and Adolescent Psychotherapy U [0.50]
This course introduces a variety of therapeutic models for addressing problems of atypical development.

PSYC*6610 Advanced Child and Adolescent Psychotherapy U [0.50]
This course will consider newly emerging developments in child and adolescent psychotherapy, as well as issues of power relationships, cultural sensitivity and empirical support. In preparation, students should endeavor to complete two therapy cases prior to the commencement of the course.

Prerequisite(s): PSYC*6580 and PSYC*6472 (may be taken concurrently).

Restriction(s): This course is open only to graduate students in the CP:ADE field.

PSYC*6630 Developmental Psychology U [0.50]
This course examines issues in the areas of cognitive, social, and emotional development. Specific research topics and theoretical issues concerning the nature of development are discussed.

PSYC*6690 Cognitive Assessment of Children and Adolescents U [0.50]
This course considers standards, ethics, uses and interpretation of selected intelligence and other cognitive tests. Students administer tests, score, interpret and write reports under supervision. As a prerequisite for PSYC*6471, a passing grade and a satisfactory rating on the practical component must be achieved.

Restriction(s): This course is open only to graduate students in the CP:ADE field.
This course considers projectives, questionnaires, observations and interviews for assessing children's personality and behaviour. Students administer tests, score, interpret and write reports under supervision. As a prerequisite for PSYC*6471, a passing grade and a satisfactory rating on the practical component must be achieved.

Restriction(s): This course is open only to graduate students in the CP:ADE field.

This course practicum is typically undertaken at the Center for Psychological Services, one day a week over a semester, to enhance skills introduced in other clinical courses.

Restriction(s): Restricted to students in the CP:ADE area of specialization

This course practicum is undertaken in a school board, psychological services department for two days a week over one semester. Students will develop clinical assessment skills with a diversity of clients, work with interdisciplinary teams, and apply knowledge of ethics and jurisprudence to educational settings.

Prerequisite(s): PSYC*6010, PSYC*6690, and PSYC*6700

Restriction(s): Restricted to students in the CP:ADE area of specialization

This course practicum is undertaken in a children's mental health setting two days a week over two semesters. Students will develop complex assessment and therapy skills with diverse clients, work with interdisciplinary teams, and apply knowledge of ethics and jurisprudence to mental health settings.

Prerequisite(s): PSYC*6471 or PSYC*7992

Restriction(s): Restricted to students in the CP:ADE area of specialization

A mark of satisfactory (SAT) in this course indicates that a student in the Clinical Psychology: Applied Developmental Emphasis (CP:ADE) field has successfully completed a full year (1800-2000 hour) internship in an accredited clinical setting (e.g., CPA or APA) approved by the Director of Clinical Training for CP:ADE.

Prerequisite(s): Completion of all course work in the CP:ADE field, the PhD qualifying examination, and the PhD Thesis proposal at the time of application, one year in advance of beginning the clinical internship.

This course considers projectives, questionnaires, observations and interviews for assessing children's personality and behaviour. Students administer tests, score, interpret and write reports under supervision. As a prerequisite for PSYC*6471, a passing grade and a satisfactory rating on the practical component must be achieved.

Restriction(s): This course is open only to graduate students in the CP:ADE field.

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.

Restriction(s): Psychology students only.

This course considers projectives, questionnaires, observations and interviews for assessing children's personality and behaviour. Students administer tests, score, interpret and write reports under supervision. As a prerequisite for PSYC*6471, a passing grade and a satisfactory rating on the practical component must be achieved.

Restriction(s): This course is open only to graduate students in the CP:ADE field.

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.

Restriction(s): Psychology students only.
Public Health

The Master of Public Health (MPH) program is a 5-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 for a career in public health or to public health professionals wishing to upgrade their skills. 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

Program Coordinator
Andrew Papadopoulos (203 McNabb House, Ext. 53894)
apapadop@uoguelph.ca

Graduate Coordinator
David Kelton (2537 Stewart Bldg., Ext. 54808)
dkelton@uoguelph.ca

Graduate Secretary
Mary Elliott (CLRE 102 OVC, Ext. 54780)
melliott@ovc.uoguelph.ca

Graduate Faculty

Olaf Berke
Associate Professor, Population Medicine

Patrick Boerlin
Associate Professor, Pathobiology

Catherine Dewey
Professor, Population Medicine

Robert Friendship
Professor, Population Medicine

Claire Jardine
Assistant Professor, Pathobiology

Andria Jones
Associate Professor, Population Medicine

Scott A. McEwen
Professor and Graduate Co-ordinator, Population Medicine

Paula L. Menzies
Associate Professor, Population Medicine

Eva Nagy
Professor, Pathobiology

Andrew Papadopoulos
Associate Professor, Population Medicine and Coordinator, Master of Public Health Program

David Pearl
Associate Professor, Population Medicine

Andrew Peregrine
Associate Professor, Pathobiology

John Prescott
Professor, Pathobiology

Jan Sargeant
Professor, Population Medicine

Elizabeth Stone
Professor and Dean, Ontario Veterinary College

Scott Weese
Associate Professor, Pathobiology

MPH Program

The objective of the MPH program is to prepare students for careers in public health. The curriculum is based on the core competencies for public health in Canada. Required courses will provide students with skills 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 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 DVM, BScN or MD professional degrees (or equivalents), honours BSc in Biomedical Sciences, Biological Sciences, or Occupational and Public Health. Students with an honours degree without a biological or health focus will be required to complete the distance education BSc course Principles of Disease prior to enrolling in the degree program. Candidates should have earned a B+ average in their honours BSc degree or at least a B- average in a professional degree (e.g., BScN, DVM, or MD). All applicants should submit a one-page statement of interest and career goals in public health. Students will be admitted into the Fall semester. Additional information can be found at the MPH website.

Degree Requirements

The MPH program at the Ontario Veterinary College will typically consist of five consecutive semesters of full-time study. Full-time students will take three semester-length courses for four semesters (total 12 courses) 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 to add one additional elective to their course load during each of the Fall and Winter first-year and Fall second-year semesters (four courses / semester).

Students will complete at least six (0.50 credit) courses before they begin the practicum (between May and August inclusive), which will provide the opportunity to add function to the knowledge base achieved during the didactic portion of the program. A paper and seminar developed from data gathered during the practicum will illustrate the cumulative experience. This is a residency program as core courses and most electives are not offered through distance education. Students may enroll part-time while they continue to work in their public health or regulatory careers. Part-time students will normally take one or two courses per semester.

Graduate Diploma

This stand-alone diploma consists of four courses, including Research Projects in Public Health, at least two other required courses and one elective course. Students may request a transfer from the Graduate Diploma into the MPH and if accepted, will receive credit for the courses taken (except for the Research Projects in Public Health course). Students interested in this option must apply to the MPH prior to initiating graduation procedures from the Graduate Diploma.

Admission Requirements

Eligible applicants include those with DVM, BScN or MD professional degrees (or equivalents), honours BSc in Biomedical Sciences, Biological Sciences, or Occupational and Public Health. Students with an honours degree without a biological or health focus will be required to complete the distance education BSc course Principles of Disease prior to enrolling in the degree program. Candidates should have earned a B+ average in their honours degree or at least a B- average in a professional degree (e.g., BScN, DVM, or MD).

Diploma Requirements

The Graduate Diploma program at the Ontario Veterinary College consists of four courses, including Research Projects in Public Health, at least two required courses, and one elective course.

Courses

Required Courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PABT*6500</td>
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</tr>
<tr>
<td>PCON*6530</td>
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<tr>
<td>PCON*6540</td>
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<td>PCON*6560</td>
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<td>PCON*6580</td>
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Electives

Three electives are required and must be approved by the program in advance.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Credits</th>
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<tr>
<td>ANTH*6140</td>
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<td>ECON*6800</td>
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<td>EDRD*6690</td>
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<td>ENGG*6640</td>
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</table>

May 13, 2014  2012-2013 Graduate Calendar
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
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<tbody>
<tr>
<td>FARE*6600</td>
<td>Food Security and the Economics of Agri Food Systems in DevelopingCountries</td>
</tr>
<tr>
<td>FRAN*6020</td>
<td>Qualitative Methods</td>
</tr>
<tr>
<td>FRAN*6270</td>
<td>Issues in Family-Related Social Policy</td>
</tr>
<tr>
<td>FRAN*6510</td>
<td>Nutrition in the Community</td>
</tr>
<tr>
<td>FRAN*6620</td>
<td>Nutritional Epidemiology</td>
</tr>
<tr>
<td>FSQA*6150</td>
<td>Food Quality Assurance Management</td>
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<tr>
<td>FSQA*6200</td>
<td>Food Safety Systems Management</td>
</tr>
<tr>
<td>FSQA*6600</td>
<td>Principles of Food Safety and Quality Assurance</td>
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<tr>
<td>GEOG*6281</td>
<td>Environmental Management and Governance</td>
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<td>HHNS*6040</td>
<td>Research Fronts in Nutritional and Nutraceutical Sciences</td>
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<tr>
<td>IDEV*6100</td>
<td>International Development Studies Seminar</td>
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<tr>
<td>MCB*6330</td>
<td>Molecular Biology of Viruses</td>
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<tr>
<td>PABI*6000</td>
<td>Bacterial Pathogenesis</td>
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<tr>
<td>PABI*6330</td>
<td>Viral Diseases</td>
</tr>
<tr>
<td>PABI*6350</td>
<td>Molecular Epidemiology of Bacterial Diseases</td>
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<tr>
<td>PABI*6550</td>
<td>Epidemiology of Zoonoses</td>
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<tr>
<td>PHIL*6240</td>
<td>Biomedical Ethics</td>
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<tr>
<td>PHIL*6760</td>
<td>Science and Ethics</td>
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<tr>
<td>POLS*6400</td>
<td>Comparative Social Policy</td>
</tr>
<tr>
<td>POLS*6630</td>
<td>Approaches to Public Policy</td>
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<tr>
<td>POLS*6640</td>
<td>Canadian Public Administration: Public Sector Management</td>
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<tr>
<td>POPM*6210</td>
<td>Epidemiology II</td>
</tr>
<tr>
<td>POPM*6230</td>
<td>Applied Clinical Research</td>
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<tr>
<td>POPM*6290</td>
<td>Statistics for the Health Sciences</td>
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<tr>
<td>POPM*6350</td>
<td>Safety of Foods of Animal Origins</td>
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<tr>
<td>POPM*6950</td>
<td>Studies in Population Medicine</td>
</tr>
<tr>
<td>PSYC*6590</td>
<td>Social and Community Intervention</td>
</tr>
<tr>
<td>PSYC*7020</td>
<td>Employee Performance</td>
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<tr>
<td>PSYC*7030</td>
<td>Work Attitudes and Behaviour</td>
</tr>
<tr>
<td>RPD*6070</td>
<td>Project Development: Principles, Procedures, and Selected Methods</td>
</tr>
<tr>
<td>RPD*6080</td>
<td>Environment and Development: Biophysical Resources and Sustainable Development in Rural Environments</td>
</tr>
<tr>
<td>RPD*6390</td>
<td>Rural Social Planning</td>
</tr>
<tr>
<td>SOC*6270</td>
<td>Diversity and Social Equality</td>
</tr>
<tr>
<td>STAT*6950</td>
<td>Statistical Methods for the Life Sciences</td>
</tr>
<tr>
<td>STAT*6960</td>
<td>Design of Experiments and Data Analysis for the Life Sciences</td>
</tr>
</tbody>
</table>
Public Issues Anthropology

The Departments of Sociology and Anthropology at the University of Guelph and Anthropology at Waterloo offer a joint program leading to an MA in Public Issues Anthropology. This MA program consists of members from both university departments and is administered by a joint co-ordinating committee. Students interested in graduate work in Public Issues Anthropology can send applications for admission to either university. 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

Public Issues Anthropology Graduate Coordinator
Elizabeth Finnis (609 MacKinnon, Ext. 53234) efinnis@uoguelph.ca

Graduate Secretary
Shelagh Daly (624 MacKinnon, Ext. 53895) daly@uoguelph.ca

Graduate Faculty

Elizabeth Finnis
BA McMaster, MA Western, PhD McMaster - Associate Professor

Edward J. Hedican
BA Lakehead, MA McMaster, PhD McGill - Professor

Satsuki Kawano
BA Keio, MA Minnesota, PhD Pittsburgh - Associate Professor

Belinda Leach
BA Carleton, MA, PhD Toronto - Professor

Marta Rohatynskyj
AB Wayne State, BA Carleton, MA, PhD Toronto - Associate Professor

Renée Sylvain
BA Wilfrid Laurier, MA, PhD Toronto - Associate Professor

Graduate Faculty from the University of Waterloo

Nancy Barrickman
BA Duke, MA Colorado State, MS Colorado State

Jasmin Habib
BA Trent, MA Notre Dame, PhD McMaster

Maria Liston
BA Tennessee, MA Indiana, PhD Tennessee

Robert W. Park
BA Toronto, MA McMaster, PhD Alberta

MA Program

Admission Requirements

Applicants must possess an Honours BA (4 years) degree or its equivalent with at least a B+ average in the final two undergraduate years. Students who do not meet departmental requirements, e.g., students whose undergraduate degree does not include basic courses in sociology and/or anthropology, may be admitted provisionally.

Degree Requirements

The MA program allows students to become actively involved in advanced studies and research in Anthropology. Students have the option of writing a thesis or a major paper. Students who choose the thesis option must complete a minimum of 2.0 credits, conduct research, and write a thesis. Students who choose the major paper option must complete a minimum of 4.0 credits (including 1.0 credit in the Major Paper course) and write a thesis. Students who choose the major paper option must complete a minimum of 2.0 credits, conduct research in Anthropology. Students have the option of writing a thesis or a major paper.

Core courses

ANTH*6140 Qualitative Research Methods W [0.50]
An examination of the methods of qualitative research, including participant observation and unstructured interviews, as well as the ethical considerations of fieldwork. Other topics, such as comparative and historical methods, may be included.

ANTH*6080 Anthropolgical Theory F [0.50]
An examination of classical and contemporary anthropological theory, including an emphasis on the most recent directions in the discipline.

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.

E elective courses (at Guelph)

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.

ANTH*6420 Global Agro-Food Systems, Communities and Rural Change U [0.50]
This course will reflect recent sociological interests in food studies and global agro-food systems, resources and the environment, community sustainability, rural-urban linkages, the transnationalization of labour regimes, and social movements in the rural context. The course will encourage students to take a comparative and historical approach, focussing on cross-national and inter-regional studies where possible, and to examine how class, gender, race and ethnicity play out in each particular substantive topic comprising the rural field.

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, as well 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.

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.

ANTH*6550 Selected Topics in Theory and Research U [0.50]
This course will be offered with varying content focusing on theory or research.

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.

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.
Rural Planning and Development

Rural Planning and Development has a four-part mission of teaching, research, training and outreach.

Administrative Staff

Director, SEDRD
Wayne Caldwell (101 Landscape Architecture, Ext. 56420)
wcdwel@uoguelph.ca

Graduate Coordinator
Harry Cummings (102B Landscape Architecture, Ext. 53637)
cummingssharry@hotmail.com

Graduate Secretary
Sue Hall (100 Landscape Architecture, Ext. 56780)
shall@uoguelph.ca

Graduate Faculty

Wayne J. Caldwell
BA, MA Western Ontario, PhD Waterloo, MCIP - Professor

F. Harry Cummings
BA Western Ontario, MA, PhD Clark, MCIP - Professor

John F. Devlin
BA Dalhousie, MA Calgary, MA Carleton, PhD Guelph - Associate Professor

John E. FitzGibbon
BA McMaster, MSc Wales, PhD McGill, MCIP - Professor

John FitzSimons
BA Wales, MA McMaster, PhD Western Ontario - Associate Professor

Nonita T. Yap
BSc San Carlos (Philippines), MES Dalhousie, PhD Alberta - Professor

MSc (Planning) Program

Rural Planning and Development provides the opportunity for graduate study, research and professional development in rural planning and development in either Canadian or international development contexts. The program leads to an MSc (Planning) degree. It is a professionally accredited (Canadian Institute of Planners) program that requires substantial commitment to professional performance and ethics. Graduate students in Rural Planning and Development find employment in rural planning departments, governments, non-governmental organizations, and private consulting firms in Canada and overseas. Graduates are prepared for both local development and planning as well as national-level research and policy planning in international and Canadian contexts. The program goal is to ensure that students have the knowledge and skill to conduct interdisciplinary research and, in a professional capacity, guide processes of change in rural planning and development. Where appropriate, faculty from other academic units participate in an advisory capacity in students' research programs.

Admission Requirements

The program is open to qualified graduates from all disciplines including geography, international development, sociology, agriculture, environmental studies, landscape architecture, economics and planning. Applicants are required to demonstrate their specific interest in the program and relevant work experience in rural planning and development. A four-year honours degree with a B- average is considered the normal basis for admission.

Degree Requirements

MSc (Planning) in Rural Planning and Development (Canadian)

This field offers both major research paper and thesis options. Both of these options 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.

For the Major Paper Option, these consist of:

- RPD*6170 [0.50] Rural Research Methods
- RPD*6380 [0.50] Application of Quantitative Techniques in Rural Planning and Development

For the Thesis Option, these consist of:

- RPD*6170 [0.50] Rural Research Methods
- RPD*6380 [0.50] Application of Quantitative Techniques in Rural Planning and Development

In addition, students are required to complete a minimum of seven courses (electives) plus the Major Research Paper or five courses (electives) plus the Thesis. 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, and in many cases, an internship. The program makes available a set of options to assist in developing the area of emphasis.

In the delivery of the Canadian rural planning and development field, the program draws on courses and faculty from other units on campus as well as on the resources of the school. The field of rural planning and development (Canadian) is formally recognized by the Canadian Institute of Planners, and three faculty within the program along with two faculty from programs within the School of Environmental Design and Rural Development who are Registered Professional Planners.

MSc (Planning) in Rural Development Planning (International)

This field prepares students for research and practice in international rural planning and development. Students may choose either the course work and major research paper option, or the course work and thesis option. An internship is not a field requirement but is strongly recommended.

All students enrolled in this field are required to complete a set of core courses that provide a foundation for international rural planning and development research and practice.

For the Major Research Paper Option, these consist of:

- 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*6360 [1.00] Major Research Paper

For the Thesis Option, these consist of:

- 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*6360 [1.00] Major Research Paper

Students may develop an area of specialization with their advisory committees through course work, selection of elective courses, student research leading to the major research paper or thesis and, in many cases, an internship. The program makes available a set of options to assist in developing the area of emphasis.

In the delivery of the International rural planning and development field, the program draws on courses and faculty from other units on campus as well as on the resources of the School. The field of rural planning and development (International) is formally recognized by the Canadian Institute of Planners, and three faculty within the program along with two faculty from programs within the School of Environmental Design and Rural Development who are Registered Professional Planners.

MPLAN Program

Rural Planning and Development provides the opportunity for graduate study, applied research and professional development in Rural Planning and Development in either Canadian or International development contexts. The program leads to a Master of Planning (MPLAN) degree.

This 1 year program is geared towards more experienced graduates working for an agency or non governmental organization abroad or in Canada; or for mature Canadian planners working in a municipal planning environment, for other levels of government, in professional consulting, non governmental organizations or other contexts or for graduates of related professional programs. It is explicitly designed for individuals wishing to upgrade their professional training to the Masters level without necessarily withdrawing from the work force for an extended period of time.

Admission Requirements

The program is open to:

1. Qualified graduates from relevant disciplines (minimum B+ average) with 4-5 years of relevant experience. Relevant experience is determined by the admissions committee.

2. Graduates from a professional program in Planning, Landscape Architecture, Architecture or Engineering (minimum B+ average).

All applicants are required to demonstrate their specific interest in the program and their work and educational experience relating to rural planning and development.

Degree Requirements

• Four courses from the MSc (Planning) course list related to their research interest, chosen with the advice of their Advisory Committee.
Elective Courses

Students are to select their electives from the following knowledge and skills courses. This list of electives is modified from time to time by the RPD Program Committee, and the student should contact the Program Committee for the current list of available electives. An RPD core course from outside your required program 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 and not included below.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>RPD*6070</td>
<td>Project Development: Principles, Procedures, and Selected Methods</td>
<td>[0.50]</td>
</tr>
<tr>
<td>EDRD*6000</td>
<td>Qualitative Analysis in Rural Development</td>
<td>[0.50]</td>
</tr>
<tr>
<td>EDRD*6050</td>
<td>Farming Systems Analysis and Development</td>
<td>[0.50]</td>
</tr>
<tr>
<td>EDRD*6100</td>
<td>Disaster Planning and Management</td>
<td>[0.50]</td>
</tr>
<tr>
<td>EDRD*6150</td>
<td>Economic Development Policy and Practice for Rural and Smaller Communities</td>
<td>[0.50]</td>
</tr>
<tr>
<td>EDRD*6630</td>
<td>Regional Planning</td>
<td>[0.50]</td>
</tr>
<tr>
<td>EDRD*6690</td>
<td>Program Evaluation</td>
<td>[0.50]</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>EDRD*6080</td>
<td>Environment and Development: Biophysical Resources and Sustainable Development in Rural Environments</td>
<td>[0.50]</td>
</tr>
<tr>
<td>EDRD*6220</td>
<td>Planning and Development Policy Analysis</td>
<td>[0.50]</td>
</tr>
<tr>
<td>EDRD*6280</td>
<td>Advanced Planning Practice W</td>
<td>[0.50]</td>
</tr>
<tr>
<td>EDRD*6290</td>
<td>Special Topics in Rural Planning and Development</td>
<td>[0.50]</td>
</tr>
<tr>
<td>EDRD*6310</td>
<td>Environmental Impact Assessment</td>
<td>[0.50]</td>
</tr>
<tr>
<td>EDRD*6320</td>
<td>Water Resource Management</td>
<td>[0.50]</td>
</tr>
<tr>
<td>EDRD*6370</td>
<td>Economic Development Planning and Management for Rural Communities</td>
<td>[0.50]</td>
</tr>
<tr>
<td>EDRD*6390</td>
<td>Rural Social Planning</td>
<td>[0.50]</td>
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</tbody>
</table>

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.

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.

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.

Restrictions(s): RPD*6250

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's signature required

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.

The course provides an introduction to rural planning practice. This includes: i) Concepts in Public Administration - The structure, responsibility and functions of public sector administration and government. ii) The workings of local government. iii) Rural Planning Practice - An introduction to planning and development in rural regions and small municipalities.

Restrictions(s): Major Paper only

This course explores the administration of rural development by considering the main organizational types delivering rural programs. The structure and behaviour of these organizations, their interactions, and their respective sectors will be considered. Students will also be introduced to administrative planning tools.

Students not pursuing the thesis route must satisfactorily complete a Major Research Paper. The paper will be supervised by a faculty committee. Content of the paper will generally focus on the placement of a problem in rural planning and development practice using appropriate methodological and analytical procedures. Note: This is a one semester course and must be completed in the semester of registration. Instructor's signature required.

Restriction(s): For Major Paper option only

Analysis and application of standard quantitative, statistical and computer-based techniques utilized in rural planning and development. Problems of data collection, analysis and interpretation.
<table>
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<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>RPD*6410</td>
<td>Readings in Rural Planning U [0.50]</td>
<td></td>
<td>A program of supervised independent study related to the student's area of concentration. Nature and content of the readings course are agreed upon between the student and the instructor, and are subject to the approval of the student's advisory committee and graduate committee.</td>
</tr>
<tr>
<td></td>
<td><strong>Restrictions:</strong> Instructor's signature required.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RPD*6450</td>
<td>Recreation and Tourism Planning and Development U [0.50]</td>
<td></td>
<td>This course is intended to instruct the student in the principles of planning for recreation and tourism development. Emphasis is placed on the economic and social benefits and costs that accrue from tourism and recreation development. Planning principles are applied to this context.</td>
</tr>
</tbody>
</table>
The objective of the PhD 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 will greatly enhance the multidisciplinary approaches in the program. The program also seeks to achieve the significant participation of women and aboriginal people from North America and international students. The co-ordinator of the program receives applications directly from prospective students or through prospective advisors and ensures that application files are complete for review by the admission committee. The committee then consults with prospective advisors and recommends applicants for admission to the Office of Graduate Studies. Applicants should consult the coordinator for the deadline for admission.

**Degree Requirements**

**Advisory Committee**

Each doctoral student has an advisory committee composed of faculty members from a range of disciplines pertinent to the field, specialization and research topic. Each committee consists of at least three members. Committees are broadly based with at least two major disciplines represented by its members. The advisor and the advisory committee provide guidance to allow for the student's intellectual growth in the program. The advisory committee assesses and approves the thesis-research proposal which is to be prepared by the student by the end of the second year, concurrent with preparation for the qualifying examination.

**Course Requirements**

The minimum course and credit requirements for the PhD in rural studies consist of a common 2.0-credit core of two integrative 1.0-credit courses (Sustainable Rural Systems, and Integrative Research Methods), a 0.25-credit research seminar, and one elective graduate 0.5-credit course or the RST*6500 Special Topics course. Additional courses may be required by the student's advisory committee. Make-up courses may be required prior to admission to the PhD program or early in the program. All courses will normally be completed prior to the qualifying examination. All or most of the courses should be taken in the first year of study.

To foster the interdisciplinary nature of the program, some courses are team taught. Attention is also paid to the sequencing of courses to promote interdisciplinarity.

**Qualifying Examination**

The qualifying examination for the PhD program in rural studies assesses the acceptability of the intellectual capability and research potential of students. The examination committee is constituted to represent a range of disciplines pertinent to the field.

The qualifying examination is used to determine if the student has an advanced level of knowledge and competence in the area(s) of specialization related to their research. The examination committee 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 Code</th>
<th>Course Name</th>
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</thead>
<tbody>
<tr>
<td>RST*6000</td>
<td>Sustainable Rural Systems F-W [1.00]</td>
</tr>
<tr>
<td>RST*6100</td>
<td>Integrative Research Methods F-W [1.00]</td>
</tr>
</tbody>
</table>

Sustainable development theory in the rural communities and environment context.

Research design and evaluation with a focus on measures of sustainability and interdisciplinarity applications.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Credits</th>
<th>Course Title</th>
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</thead>
<tbody>
<tr>
<td>RST*6300</td>
<td>0.25</td>
<td>Research Seminar U</td>
</tr>
<tr>
<td>RST*6500</td>
<td>0.50</td>
<td>Special Topics U</td>
</tr>
<tr>
<td>RPD*6170</td>
<td>0.50</td>
<td>Rural Research Methods</td>
</tr>
<tr>
<td>CDE*6260</td>
<td>0.50</td>
<td>Research Design</td>
</tr>
<tr>
<td>LARC*6380</td>
<td>0.25</td>
<td>Research Seminar</td>
</tr>
</tbody>
</table>

IX. Graduate Programs, Rural Studies
IX. Graduate Programs, Sociology

Sociology

The Department of Sociology and Anthropology offers programs of study leading to the degrees of MA and PhD in Sociology. See the Department website at http://www.sociology.uoguelph.ca/ for additional information.

Administrative Staff

Department Chair
Patrick Parnaby (626 MacKinnon, Ext. 56527)
pparnaby@uoguelph.ca

Graduate Coordinator
Vivian Shalla (608 MacKinnon, Ext. 52195)
vshalla@uoguelph.ca

Graduate Secretary
Shelagh Daly (624 MacKinnon, Ext. 53895)
daly@uoguelph.ca

Graduate Faculty

J. (Hans) Bakker
BA South Alabama, MA Colorado State, PhD Toronto - Professor

Myrna Dawson
BA York, MA, PhD Toronto - Associate Professor and Canada Research Chair

Elizabeth Finnis
BA McMaster, MA Western, PhD McMaster - Associate Professor

Cecil A. Foster
BA, MA, PhD York - Professor

Linda M. Gerber
BScN, MA, PhD Toronto - Associate Professor

Andrew Hathaway
BA, MA Calgary, PhD McMaster - Associate Professor

Edward J. Hedican
BA Lakehead, MA McMaster, PhD McGill - Professor

Sally Humphries
BA, MA, PhD York - Associate Professor

Linda Hunter
BA, MA Guelph, PhD York - Assistant Professor

Satsuki Kawano
BA Keio, MA Minnesota, PhD Pittsburgh - Associate Professor

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

Belinda Leach
BA Carleton, MA, PhD Toronto - Associate Professor

Madonna R. Maidment
BA, MA Memorial, PhD Carleton - Associate Professor

Mavis Morton
BA Carleton, MA, PhD York - Assistant Professor

William O'Grady
BA, MA Carleton, PhD Toronto - Professor

Patrick Parnaby
BA, MA Queen's, PhD McMaster - Associate Professor

Kerry L. Preibisch
BA, MA Simon Fraser, PhD Reading - Associate Professor

Marta Rohatynskyj
AB Wayne State, BA Carleton, MA, PhD Toronto - Associate Professor

Vivian Shalla
BA Laurentian, MSc Montreal, PhD Carleton - Associate Professor

Ron Stansfield
BSc McMaster, BA, MA Toronto, PhD York - Associate Professor

Renée Sylvain
BA Wilfrid Laurier, MA, PhD Toronto - Associate Professor

Terisa Turner
HBA York (U.K.), MA Oberlin College Ohio, PhD London - Associate Professor

Jeji Varghese
BSc, MA, PhD Alberta - Assistant Professor

David Walters
BA, MA Western, PhD McMaster - Associate Professor

Anthony R. Winson
BA Western, MA, PhD Toronto - Professor

Carolyn Yule
BA UBC, MA, PhD Toronto - Assistant Professor

MA Program

The MA program permits students to become actively involved in research, teaching and professional practice. The objective of the program is to offer opportunities for advanced studies and research in Sociology.

The Master of Arts program in Sociology covers the following fields:

- Global Agro-Food Systems, Communities and Rural Change
- Work, Gender and Change in a Global Context
- Criminology and Criminal Justice

Global Agro-Food Systems, Communities and Rural Change

This area includes rural sociology and rural development (Canada and international), women and gender relations in development, sociology of agriculture and of the rural community, community development, political economy of rural agricultural systems, agro-food systems, environment, subsistence and commodification.

Work, Gender and Change in a Global Context

This area incorporates sociology of work, the workplace, political economy, labour markets, transition from school to work, skills and lifelong learning, technological change, women and work, work and economic restructuring, the labour movement, labour process and social policy.

Criminology and Criminal Justice

This area covers sociology of policing, corrections and penology, violent crime, sociology of law, governance and control, crime prevention, risk, criminological theory, critical criminology, street youth, young offenders, gender and offending, and criminal justice theory.

Application Procedure

Graduate students are admitted each Fall semester (approximately 10 - 15 students). February 1 is the deadline for application to the MA in Sociology program or the MA in Sociology with collaborative International Development Studies program. Graduate students are admitted into the program in the Fall semester only. The program is offered on a full-time basis only. The on-line application and application information can be found at http://www.uoguelph.ca/graduatestudies/apply Program offices should be consulted for admission deadlines.

Admission Requirements

Applicants must possess an Honours BA (4 years) degree or its equivalent with at least a B+ average in the final two years of undergraduate studies. Students who do not meet departmental requirements, e.g., students whose undergraduate degree does not include basic courses in Sociology, may be admitted provisionally and required to complete appropriate make-up courses from offerings in the undergraduate program.

Degree Requirements

Students must either complete a minimum of 2.0 credits and write a thesis or complete a minimum of 4.0 credits (including 1.0 credit in the Major Paper course) 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.

Students typically begin their studies in the Fall semester. When you arrive, the graduate coordinator will inform you as to which faculty members, on the basis of their areas of specialization, are likely candidates for membership on your advisory committee. Until you have formed your advisory committee, graduate coordinator will fill out your evaluation reports.

All students are required to pass SOC*6700, Pro-Seminar. This is a two semester course (Fall and Winter) and is graded as SAT/UNSAT. This course is intended to introduce students to the department, the university, and the profession of Sociology.

PhD Program

The doctoral program comprises three fields within the discipline of Sociology that build on current faculty strengths. These fields are:

- Global Agro-Food Systems, Communities and Rural Change
- Work, Gender and Change in a Global Context
- Sociological Criminology

Global Agro-Food Systems, Communities and Rural Change

This field reflects recent sociological interests in food studies and global agro-food systems, resources and the environment, community sustainability, rural-urban linkages, the transnationalization of labour regimes and social movements in the rural context. Students specializing in this field will be encouraged to take a comparative and historical approach, focusing on cross-national and inter-regional studies where possible, and to examine how class, gender, race and ethnicity play out in each particular substantive topic comprising the rural field.
Work, Gender and Change in a Global Context
This field reflects recent sociological interests in changing patterns of work and employment in comparative contexts, labour regimes, industrial and organizational change, organizations and protest, education for work and the regulation of work. These trends are located in the broader processes of globalization, economic restructuring and fundamental shifts in public policy. Students specializing in this field will be encouraged to focus on the dialectical relationship between the configurations of gender, class, race and ethnicity, and the transformation of work.

Sociological Criminology
The field reflects recent sociological interests in homelessness and marginalized peoples, violence against women, homicide, wrongful convictions, crime prevention through environmental design, policing, harm reduction and substance use/abuse, violent offending and victimization, and young offenders.

Degree Requirements
All students in the PhD program are required to successfully complete four courses during the first two semesters of study. Students must also successfully complete two qualifying examinations and a research proposal, and produce and orally defend a dissertation on a topic that has been approved by the advisory committee.

Admission Requirements
Normally, only applicants with a recognized MA degree in Sociology and with high academic standing (80% or higher) in their graduate-level studies will be admitted into the program.

Students are expected to have successfully completed Master’s-level courses in sociological theory as well as Master’s-level qualitative and quantitative methodology courses in Sociology. It is also expected that students will have taken courses across the breadth of Sociology.

Admission Procedure
Graduate students are admitted into the program in the Fall semester only. The program is offered on a full-time basis only. Program offices should be consulted for admission deadlines. The on-line application and application information can be found at http://www.uoguelph.ca/cids/

Interdepartmental Programs
International Development Studies Collaborative MA and PhD Programs
The Department of Sociology and Anthropology participates in the collaborative International Development Studies (IDS) MA and PhD programs. Please consult the International Development Studies listing http://www.uoguelph.ca/cids/ for a detailed description of the MA and PhD collaborative programs and the special additional requirements for each of the participating departments. Applications should be submitted directly to the Department of Sociology and Anthropology.

Courses

General

SOC*6700 Pro-seminar F-W [0.00]
The pro-seminar concerns matters involved in graduate studies and later work as a professional sociologist, including how to form a graduate advisory committee, assistantship responsibilities, presentation skills, exploration of careers in sociology, writing grant proposals, reports and articles, and teaching.

Restriction(s): Students in the MA program in Sociology only

SOC*6800Advanced Topics in Sociology F [0.50]
This course will focus on the foundations of sociological theories and the broader philosophical context of inquiry in sociological research. Students will develop an advanced understanding of the research process through study, analysis and critical assessment of a range of theoretical and methodological approaches and issues.

Prerequisite(s): MA in Sociology

Restriction(s): Students in the PhD program in Sociology only

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.

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.

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.

Global Agro-Food Systems, Communities and Rural Change

SOC*6420 Global Agro-Food Systems, Communities and Rural Change U [0.50]
This course will reflect recent sociological interests in food studies and global agro-food systems, resources and the environment, community sustainability, rural-urban linkages, the transnationalization of labour regimes, and social movements in the rural context.

The course will encourage students to take a comparative and historical approach, focusing on cross-national and inter-regional studies where possible, and to examine how class, gender, race and ethnicity play out in each particular substantive topic comprising the rural field.

Work, Gender and Change in a Global Context

SOC*6480 Work, Gender and Change in a Global Context U [0.50]
This course will consider some of the theoretical frameworks available for examining work, workers and work places in the context of globalization, economic restructuring, and shifts in public policy. Using case studies of particular work worlds, the course may include topics such as changing patterns of work and employment in comparative contexts, labour regimes, industrial and organizational change, organizations and protest, education for work, and the regulation of work. The course will focus on the dialectical relationship between the configurations of gender, class, race and ethnicity and the transformation of work.

Criminology and Criminal Justice/Sociological Criminology

SOC*6350 Society, Crime and Control U [0.50]
This seminar course surveys classical theoretical perspectives and more recent theoretical developments in the sociology of crime. It will examine the assumptions and logical structure of each perspective and justifications of particular criminal justice/policy responses. The course will also critically assess recent empirical research relevant to each perspective.

Other

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.

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.

SOC*6500 Social Movements in Latin America W [0.50]
Students will critically review the major theoretical perspectives on social movements and consider their relevance in understanding the timing, tactics, and impact of movements in Latin America. Movements to be examined may include labour, peasant, armed insurgent, indigenous, feminist, gay rights, and anti-globalization struggles.

SOC*6550 Selected Topics in Theory and Research U [0.50]
This course will be offered with varying content focusing on theory or research.

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.

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.
<table>
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<tr>
<th>Course Code</th>
<th>Title</th>
<th>Description</th>
<th>Restriction(s)</th>
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<tbody>
<tr>
<td>SOC*6810 Reading Course U [0.50]</td>
<td>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.</td>
<td>Students in the PhD program in Sociology only</td>
<td></td>
</tr>
<tr>
<td>SOC*6820 Directed Readings U [0.50]</td>
<td>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.</td>
<td>Students in the PhD program in Sociology only</td>
<td></td>
</tr>
</tbody>
</table>
**Administrative Staff**

**Director**  
John D. Kissick (203 Zavitz Hall, Ext. 56930)  
kissick@uoguelph.ca

**Graduate Secretary**  
Barb Merrill (201 Zavitz Hall, Ext. 54671)  
merrill@uoguelph.ca

**Graduate Co-ordinator**  
Will Gorlitz (414 Zavitz Hall, Ext. 53224)  
gorlitz@uoguelph.ca

**Graduate Faculty**

- **Diane Borsato**  
  BFA York, MFA Concordia - Assistant Professor

- **James Carl**  
  BFA Victoria, BA McGill, MFA Rutgers - Associate Professor

- **Susan Dobson**  
  International BA Lester B. Pearson College of the Pacific, BAA Ryerson, MFA Guelph - Associate Professor

- **Robert Enright**  
  BA Saskatchewan - Professor

- **Christian Giroux**  
  BFA Victoria, MFA Nova Scotia College of Art and Design - Associate Professor

- **Kim Kozi (FASTWÜRMS)**  
  AOCA Ontario College of Art - Associate Professor

- **Jean Maddison**  
  Dip. AD Coventry College of Art England, MFA Royal College of Art - Associate Professor

- **Martin Pearce**  
  BFA, MFA Royal College of Art England - Assistant Professor

- **Sandra Rechico**  
  BEd Alberta - Associate Professor

- **Dai Skuse (FASTWÜRMS)**  
  BFA Queen's - Associate Professor

- **Monica Tap**  
  BFA, MFA Nova Scotia College of Art and Design - Associate Professor

- **Laurel Woodcock**  
  BFA Concordia, MFA Nova Scotia College of Art and Design - Associate Professor

**Additional Faculty in the School of Fine Art and Music**

- **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

**MFA Program**

The MFA program in the field of studio art offers specializations in drawing, painting, printmaking, sculpture, and alternative practices. Though emphasizing studio practice, the program includes courses in art theory, criticism, history and pedagogy. A thesis exhibition is also required. The objective of the program is to prepare students as professional artists and artist-teachers.

The MFA is intended to represent 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 their intense involvement with studio practice, students will be required to demonstrate their pertinent knowledge and judgment about the visual arts in presentations, discussions, and written papers within the required course work.

**Admission Requirements**

Admission to the master of fine arts program in studio art may be granted on the recommendation of the School of Fine Art and Music to:

1. the holder of a BFA degree (honours equivalent), or an honours BA (or its equivalent in fine or visual arts); or
2. in exceptional cases, the holder of a degree in another field who has completed a minimum of six one-semester courses in fine or visual art; or
3. a student who has 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 10 minutes DVD. (For formatting information please see the 'GRADUATE STUDIES' section of the School of Fine Art and Music website.)
2. A single-page statement that outlines the applicant's career objectives and reasons for wishing to study in the University of Guelph's master of fine arts program in studio art.
3. Letters of reference from two studio professors. The applicant must have taken a significant proportion of course work from at least one of the professors. An acceptable alternative to one such letter may be from the department chair on behalf of the department in which the applicant has studied, or from a professional in the field who is familiar with the applicant's abilities.

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

**Degree Requirements**

The MFA degree at the University of Guelph requires the attainment of a professional level of studio practice, and a sophisticated awareness of contemporary discourse in visual arts as well as a detailed knowledge of the selected field of specialization. Each degree candidate will complete a thesis. The MFA thesis consists of an 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 (the complete MFA degree regulations are to be found in the Degree Regulations section of this calendar):

**Minimum Duration**

The minimum duration is at least four semesters of full-time study.

**Prescribed Studies**

A total of 10.0 credits is required for the completion of this program. In addition to individually oriented studio courses, students are required to complete four MFA seminars; two graduate courses in art theory and criticism courses; and two teaching practicum courses.

A maximum of two courses outside the School of Fine Art and Music may be substituted for courses in art history, theory and criticism. The courses selected must be acceptable to the school and the Assistant VP of 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 at least 'B-' standing.

**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 courses may be at either the undergraduate or the graduate level.

**Exhibition/Paper**

Each degree candidate must present an exhibition, performance, or showing of their studio work, as well as a critical paper of approximately 4,000 - 5,000 words that articulates the significant aesthetic investigation, as approved by the candidate's master's examination committee.

**The Master's Examination**

At the time of the exhibition, the MFA candidate will be expected to successfully complete a final oral examination devoted chiefly to the MFA exhibition with reference to the supporting critical paper. This is a school examination identified as the master's examination.

**School Regulations**

In addition to meeting the university's MFA regulations regarding thesis format, the candidate must submit appropriate visual documentation of the MFA exhibition as well as the supporting critical paper to the director of the School of Fine Art and Music for inclusion in the school's archives.
### Courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Description</th>
<th>Prerequisite(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FINA*6510</td>
<td>Introduction to Graduate Studio F [1.50]</td>
<td>A qualifying open-studio course to determine the student's interests and level of performance. The student will come in contact with a variety of faculty and may choose to work in a number of areas during this period.</td>
<td></td>
</tr>
<tr>
<td>FINA*6515</td>
<td>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>FINA*6510</td>
</tr>
<tr>
<td>FINA*6530</td>
<td>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>
</tr>
<tr>
<td>FINA*6531</td>
<td>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.</td>
<td>FINA*6530</td>
</tr>
<tr>
<td>FINA*6540</td>
<td>MFA Seminar I F [0.50]</td>
<td>Examination of critical issues in the visual arts relevant to studio practice.</td>
<td>FINA*6540</td>
</tr>
<tr>
<td>FINA*6545</td>
<td>MFA Seminar II W [0.50]</td>
<td>Continuation of issues examined in FINA*6540</td>
<td>FINA*6540</td>
</tr>
<tr>
<td>FINA*6551</td>
<td>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.</td>
<td>FINA*6545</td>
</tr>
<tr>
<td>FINA*6610</td>
<td>MFA Studio II F [1.50]</td>
<td>Continuation of FINA*6515</td>
<td>FINA*6515</td>
</tr>
<tr>
<td>FINA*6615</td>
<td>MFA Studio III W [1.50]</td>
<td>Continuation of FINA*6610</td>
<td>FINA*6515</td>
</tr>
<tr>
<td>FINA*6640</td>
<td>MFA Seminar III F [0.50]</td>
<td>Continuation of FINA*6545</td>
<td>FINA*6545</td>
</tr>
<tr>
<td>FINA*6641</td>
<td>MFA Seminar IV W [0.50]</td>
<td>Continuation of FINA*6640</td>
<td>FINA*6640</td>
</tr>
<tr>
<td>FINA*6652</td>
<td>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.</td>
<td>FINA*6545</td>
</tr>
</tbody>
</table>

### Additional and Elective Courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Description</th>
<th>Prerequisite(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FINA*6650</td>
<td>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>FINA*6550</td>
</tr>
<tr>
<td>FINA*6552</td>
<td>Seminar in Canadian Art U [0.50]</td>
<td>Selected topics in Canadian Art</td>
<td>FINA*6552</td>
</tr>
<tr>
<td>FINA*6554</td>
<td>Seminar in Nineteenth Century Art U [0.50]</td>
<td>Selected topics of the period.</td>
<td>FINA*6554</td>
</tr>
<tr>
<td>FINA*6555</td>
<td>Seminar in Twentieth Century Art U [0.50]</td>
<td>Selected topics of the period.</td>
<td>FINA*6555</td>
</tr>
<tr>
<td>FINA*6650</td>
<td>Individual Study in Art History U [0.50]</td>
<td>Students will pursue special study under the guidance of a faculty member with appropriate expertise.</td>
<td>FINA*6650</td>
</tr>
</tbody>
</table>

**FINA*6651 Individual Study in Contemporary Art U [0.50]**

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.
Theatre Studies

Administrative Staff

Director
Alan Filewod (425 MacKinnon, Ext. 53268)
afilewod@uoguelph.ca

Graduate Coordinator
Ajay Heble (427 MacKinnon, Ext. 53445)
ahble@uoguelph.ca

Graduate Secretary
Olga Petrik (427 MacKinnon, Ext. 56315)
petriko@uoguelph.ca

Graduate Faculty

Elaine Chang
BA British Columbia, MA, PhD Stanford - Associate Professor

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

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

Patricia Flood
BFA Alberta - Assistant Professor

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

Sky Gilbert
BFA York, MA, PhD Toronto - Associate Professor and University Research Chair

Ric P. Knowles
BA, MA, PhD Toronto - Professor

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

Daniel O’Quinn
BSc, MA Western, PhD York - Professor

Paul W. Salmon
BA Western, MA Toronto, PhD Western - Assistant Professor

Jerrard Smith
Associate Ontario College of Art - Professor

Judith Thompson
BA, Queen’s, Cert. National Theatre School - Professor

Ann Wilson
BA, MA, PhD York - Associate Professor and Associate Dean of Arts and Social Science

MA Program

The Masters of Arts Degree in Theatre Studies is a research-based degree that offers students the opportunity of working with award winning theatre scholars and practitioners.

The program applies several dynamic approaches to theatre studies that merge theory and practice. Students take five courses, including two mandatory courses and three elective courses. The required courses include i) THST*6220, which provides a context for the discipline and establishes a consistent discourse for students working in the program; and ii) THST*6150, which introduces students to the theory and practice of theatre-historical analysis, and situates selected aspects of theatre history as a practice and an institution. The degree provides opportunities for students to pursue in depth an area of specialized research.

Elective courses are subject to the special interests of faculty research and practice; these courses will rotate regularly among core faculty. For their electives students may take any graduate course offered in English or Theatre Studies, or may apply to take graduate courses in other programs, however, it is strongly recommended that at least two of the three electives come from the Theatre Studies course offerings in the Winter Semester.

Admission Requirements

In addition to the minimum requirements stated elsewhere in the Graduate Calendar, applicants to the MA Program in Theatre Studies would normally be expected to have a baccalaureate degree in an honours program or equivalent, or at least a high second-class standing (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 Coordinator.

Applicants are not required to write the Graduate Record Examination. Successful applicants will be admitted in the Fall Semester, the Program’s only entry point. Program offices should be consulted for admission deadlines.

Applicants whose first language is not English are required to submit documentation of English language proficiency at the time of application.

Degree Requirements

All entering MA students will register for THST*6220 and THST*6150. These courses will be taken upon entrance, in the student’s first semester. Students may choose between two options for completion of degree requirements:

1. Course Work Option: the required THST*6220 and THST*6150 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.

2. Thesis Option: the required THST*6220 and THST*6150, plus one Theatre Studies elective course plus an original research-based thesis (approx. 20,000 to 25,000 words). Both the thesis and the research paper may, with approval, and contingent upon faculty availability, be completed as exercises in creative writing accompanied by critical and theoretical commentary.

Internship Opportunities

All students may apply to the Graduate Studies Committee to include an internship as part of their program as a course, or as a component of the Major Research Paper or thesis. Internships are not guaranteed, and it is the responsibility of students to make arrangements with their hosts and submit a thorough application including a clear statement of how the internship articulates and supports their program of research.

Library Resources

The University of Guelph’s library resources are remarkable for all aspects of the study of drama and theatre, and particularly for archival and special collections in Canadian theatre, theatre and performance history, theatre festivals, and individual authors. Applicants who wish to work with these collections are especially welcome.

Courses

THST*6150 Theatre Historiography F [0.50]
This variable content course introduces students to the theory and practice of theatre historical analysis. The course is required of all students in the Theatre Studies MA Program.

THST*6210 Devising W [0.50]
This variable-content course addresses creative practice in the theatre as a site for the production of knowledge. It examines the theoretical and social issues of contemporary theatre practice.

THST*6220 Theatre Theory F [0.50]
This variable content course introduces students to a range of theoretical approaches and to advanced issues and methods within the fields of drama, theatre, and performance studies. The course is required for all students in the Theatre Studies MA Program.

THST*6230 Performance and Difference W [0.50]
This variable-content course introduces students to the most recent theoretical and critical international developments in the field of Theatre Studies and investigates sites of cultural diversity and difference. It provides opportunities for culturally specific studies of dramatic literature and performance.

THST*6250 Bodies and Space in Performance W [0.50]
This variable-content course introduces students to the social, ethical, phenomenological and environmental dimensions of the interaction of bodies and space in theatre practice and research. It provides a theorized context in which students may address questions of acting, directing, and design as research processes.

THST*6280 Independent Reading Course U [1.00]
Independent Reading Course

THST*6500 Research Paper U [1.00]

THST*6801 Reading Course I U [0.50]
An independent study course, the nature and content of which is agreed upon between the individual and the person offering the course. Subject to the approval of the student’s advisory committee and the graduate committee.

THST*6802 Reading Course II U [0.50]
An independent study course, the nature and content of which is agreed upon between the individual and the person offering the course. Subject to the approval of the student’s advisory committee and the graduate committee.
Toxicology

The interdepartmental collaborative program is the focal point for graduate teaching and research in toxicology. Students wishing to undertake graduate studies at the MSc or PhD level with emphasis on toxicology will be admitted by a participating department and will register in both the participating department and in the collaborative program. The participating academic units include the Departments of Animal and Poultry Science, Biomedical Sciences, Chemistry, Human Health and Nutritional Sciences, Integrative Biology, Mathematics and Statistics, Molecular and Cellular Biology, Pathobiology, Plant Agriculture (Horticulture division) and the School of Environmental Sciences.

Administrative Staff

Director and Graduate Coordinator
Dr. Richard Manderville (SCIE 3243, Ext. 53963)
rmanderv@uoguelph.ca

Graduate Secretary
Karen Ferraro (SCIE 2513, Ext. 53044)
chemgrad@uoguelph.ca

Graduate Faculty

Manfred Brauer
Associate Professor, Molecular and Cellular Biology

Elena Choleris
Associate Professor, Psychology

Beverley Hale
Associate Professor, Land Resource Science

Christopher J. Hall
Professor, Environmental Biology

M. Anthony Hayes
Professor, Pathobiology

Ronald Johnson
Associate Professor, Biomedical Sciences

P. David Josephy
Professor, Molecular and Cellular Biology

Bettina E. Kalisch
Associate Professor, Biomedical Sciences

Niel A. Karrow
Assistant Professor, Animal and Poultry Science

Gordon M. Kirby
Assistant Professor, Biomedical Sciences

James B. Kirkland
Assistant Professor, Human Health and Nutritional Sciences

Hung Lee
Professor, School of Environmental Sciences

Francesco Leri
Assistant Professor, Psychology

Richard A. Manderville
Associate Professor, Chemistry

Linda A. Parker
Professor, Psychology and Canada Research Chair

Leonard Ritter
Professor, School of Environmental Sciences

Cynthia Scott-Dupree
Associate Professor, School of Environmental Sciences

Paul K. Sibley
Assistant Professor, School of Environmental Sciences

Trevor K. Smith
Professor, Animal and Poultry Science

E. James Squires
Professor, Animal and Poultry Science

Jack T. Trevors
Professor, School of Environmental Sciences

Glen J. Van Der Kraak
Professor, Integrative Biology and Associate Dean, Research, CBS

MSc Program

Admission Requirements

MSc students in the collaborative program in toxicology must meet the MSc admission requirements of the participating department in which they are enrolled.

Degree Requirements

MSc students in the collaborative program in toxicology must complete a minimum of 1.50 graduate credits, which must include the toxicology courses TOX*6000 and TOX*6200 and courses required by the participating department in which they are enrolled. TOX*6000 may be waived for students whose undergraduate degree included significant training in toxicology.

PhD Program

Admission Requirements

PhD students in the collaborative program in toxicology must meet the PhD admission requirements of the participating department in which they are enrolled.

Degree Requirements

PhD students in the collaborative program in toxicology must meet all the academic requirements specified by the participating department in which they are enrolled. They must also complete the courses TOX*6000 and TOX*6200 if they, or equivalent courses, were not taken as part of an MSc program.

Courses

**TOX*6000 Advanced Principles of Toxicology** S [0.50]
An intensive course in the principles of modern aspects of toxicology, taught in a lecture/case study format.

**TOX*6200 Advanced Topics in Toxicology** W [0.50]
Advanced topics in toxicology will include oral presentations by students, faculty members, and guest lecturers. The emphasis will be on advanced concepts and techniques in toxicology research with particular relevance to mechanistic, molecular and interpretive toxicology.

Restriction(s):
Credit may be obtained for only one of TOX*6200 or TOX*4200

**TOX*6590 Biochemical Toxicology** F [0.50]
The molecular mechanisms of action of carcinogens and other toxic compounds. Enzymes of biotransformation, including a detailed study of cytochrome P-450. Interactions of reactive species with DNA and other macromolecules. (Credit may be obtained for only one of TOX*4590 and TOX*6590) Department of Chemistry and Biochemistry

Other courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Credit</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOM*6440</td>
<td>0.50</td>
<td>Biomedical Toxicology</td>
</tr>
<tr>
<td>BIOM*6480</td>
<td>0.50</td>
<td>Pharmacodynamics and Pharmacokinetics</td>
</tr>
<tr>
<td>BIOM*6721</td>
<td>0.25</td>
<td>Special Topics in Pharmacology-Toxicology</td>
</tr>
<tr>
<td>BIOM*6722</td>
<td>0.50</td>
<td>Special Topics in Biomedical Pharmacology-Toxicology</td>
</tr>
<tr>
<td>CHEM*7310</td>
<td>0.50</td>
<td>Selected Topics in Biochemistry</td>
</tr>
<tr>
<td>CHEM*7600</td>
<td>0.50</td>
<td>Selected Topics in Organic Chemistry</td>
</tr>
</tbody>
</table>
Veterinary Science

The Interdepartmental Group in Veterinary Science consists of members of the graduate faculty in the Ontario Veterinary College who are involved in the doctor of veterinary science (DVSc) program. Specific functions of the group are discharged by the Interdepartmental DVSc Program Committee, which is involved with the admission, progress, and certification for graduation of students enrolled in the DVSc program.

Administrative Staff

<table>
<thead>
<tr>
<th>Position</th>
<th>Name</th>
<th>Phone</th>
<th>Email</th>
</tr>
</thead>
<tbody>
<tr>
<td>Associate Dean, Research and Innovation</td>
<td>Dr. Robert Kirby (2638 OVC, Ext. 54948)</td>
<td><a href="mailto:gkirby@ovc.uoguelph.ca">gkirby@ovc.uoguelph.ca</a></td>
<td></td>
</tr>
<tr>
<td>Graduate Secretary</td>
<td>Barbara Gaudette (2653 OVC, Ext. 54406)</td>
<td><a href="mailto:bgaudett@ovc.uoguelph.ca">bgaudett@ovc.uoguelph.ca</a></td>
<td></td>
</tr>
</tbody>
</table>

Program Committee

David Kelton
Professor, Population Medicine

Michael R. O’Grady
Associate Professor, Clinical Studies

Jeff Caswell
Associate Professor, Pathobiology

Roger Moorehead
Associate Professor, Biomedical Sciences

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, ophthalmology, cardiology and neurology
- Pathobiology
  - Clinical pathology, anatomic pathology, laboratory-animal science, and comparative 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 Interdepartmental DVSc Program Committee, to transfer to the DVSc program without completing the graduate diploma program. This authorization must be granted no later than the end of the second semester of study. The transfer will be effective the following semester.

Degree Requirements

A minimum of 2.50 course credits is required. A qualifying examination must be taken prior to the end of the sixth semester to assess the student’s knowledge of the selected area of specialization and the basic sciences supporting this area. Candidates are required to develop investigational skills in their distinctive area of specialization by carrying out an original study, generally related to animal health. The research must make a significant contribution to the area of specialization, be written up as a thesis, and defended.

At least nine semesters of full-time study must be devoted to the DVSc program. Additional information on the DVSc program may be found in the calendar description of each participating department.
Other Departments

School of Languages and Literatures

Director:
Daniel Chouinard, 265 MacKinnon, ext. 54891/53883

The School offers the following undergraduate programs:

Département D'Études Françaises

Head: Dr. Frédérique Arroyas, 278 MacKinnon, ext. 52885/53884

Classics

Head: Dr. Padraig O'Cleirigh, 244 MacKinnon, ext. 53156/53883

European Studies

Coordinator: Dr. Dorothy Odartey-Wellington, 276 MacKinnon, ext. 53179/53883

German Studies

Head: Dr. Paola Mayer, 255 MacKinnon, ext. 58562/53883

Italian Studies

Head: Dr. Mary DeCoste, 284 MacKinnon, ext. 53187/53883

Spanish Studies

Head: Dr. Stephen Henighan, 274 MacKinnon, ext. 54489/53884

The School of Languages and Literatures presently offers a program in French for graduate students. Graduate students who are required by their departments to 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 VP of 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
BA, Sp, 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.