

2004-2006 Graduate Calendar

The information published in this Graduate Calendar outlines the rules, regulations, curricula, programs and fees for the 2004-2006 academic years, including the Summer Semester 2005, the Fall Semester 2005 and the Winter Semester 2006.

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

<http://www.uoguelph.ca>

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Disclaimer

The Office of Graduate Program Services 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, 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.

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I. Schedule of Dates

Summer Semester 2005

April

Thursday, April 28	Last date to submit approved thesis for summer convocation
	Last date for application to graduate for summer convocation

May

Monday, May 2	Semester begins
Wednesday, May 11	Add period begins
Thursday, May 12	Class schedule commences
Friday, May 20	Add period ends
	Last day to drop two-semester courses (W/S)
Monday, May 23	Holiday--no classes scheduled - classes rescheduled to Thursday, August 4

June

Monday, June 6	Course selection for Fall 2005 begins--In-course students
Tuesday, June 14	Summer Convocation
Wednesday, June 15	Summer Convocation
Thursday, June 16	Summer Convocation
Friday, June 17	Summer Convocation

July

Friday, July 1	Holiday--no classes scheduled - classes rescheduled to Friday, August 5
Friday, July 8	40th class day - Last day to drop one semester courses

August

Monday, August 1	Holiday - Classes rescheduled to Monday, August 8
Thursday, August 4	Classes rescheduled from Monday, May 23, Monday schedule in effect
Friday, August 5	Classes rescheduled from Friday, July 1, Friday schedule in effect
Monday, August 8	Classes rescheduled from Monday, August 1, Monday schedule in effect
	Classes conclude
Thursday, August 11	Examinations commence
Friday, August 19	Examinations conclude
Wednesday, August 24	Last day for grade reports
Thursday, September 1	Last date to submit approved thesis for fall graduation
	Last date for application to graduate for fall graduation

Fall Semester 2005

July

Monday, July 4	Course Selection for NEW STUDENTS begins
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September

Thursday, September 1	Last day to submit approved thesis for fall graduation
	Last day for application to graduate for fall graduation
Monday, September 5	Holiday
Tuesday, September 6	Semester begins
Monday, September 12	Class schedule commences
Friday, September 16	Add period ends
	Last day to drop two-semester courses (S/F)

October

Monday, October 10	Holiday - No classes scheduled
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Tuesday, October 11	Course selection for Winter 2006 begins
Monday, October 17	Fall Graduation -- Degrees/Diplomas conferred in absentia only

November

Monday, November 7	40th class day - Last day to drop one semester courses
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December

Friday, December 2	Classes conclude
Monday, December 5	Examinations commence
Friday, December 16	Examinations conclude
Wednesday, December 21	Last day for grade reports
	Last day to submit approved thesis for Winter convocation
	Last date for application to graduate for Winter convocation

Winter Semester 2006

December

Wednesday, December 21	Last day to submit approved thesis for Winter convocation
	Last date for application to graduate for Winter convocation

January

Tuesday, January 3	Semester begins
Monday, January 9	Class schedule commences
Friday, January 13	Add period ends
	Last day to drop two-semester courses (F/W)

February

Monday, February 20	Winter Break begins--no classes scheduled this week
	Winter Convocation
Tuesday, February 21	Winter Convocation
Wednesday, February 22	Winter Convocation
Thursday, February 23	Winter Convocation
Friday, February 24	Winter Break ends
Monday, February 27	Classes resume

March

Friday, March 3	Course selection period for Summer 2006 and Fall 2006 begins
Friday, March 10	40th class day - Last day to drop one semester courses

April

Friday, April 7	Classes conclude
Monday, April 10	Examinations commence
Friday, April 14	Holiday - No examinations scheduled
Monday, April 24	Examinations conclude
Friday, April 28	Last date for grade reports
	Last date to submit approved thesis for summer convocation
	Last date for application to graduate for summer convocation

Summer Semester 2006

April

Friday, April 28	Last date to submit approved thesis for summer convocation
	Last date for application to graduate for summer convocation

May

Monday, May 1	Semester begins
Wednesday, May 10	Add period begins
Thursday, May 11	Class schedule commences

Monday, May 15	Last day to add Summer Session courses
Friday, May 19	Add period ends
	Last day to drop two-semester courses (W/S)
Monday, May 22	Holiday--no classes scheduled - classes rescheduled to Thursday, August 3 - Summer Session classes not cancelled

June

Friday, June 2	Last day to drop Summer Session courses
Monday, June 5	Course selection for Fall 2006 begins--In-course students
Monday, June 12	Summer Convocation
Tuesday, June 13	Summer Convocation
Wednesday, June 14	Summer Convocation
Thursday, June 15	Summer Convocation
Friday, June 16	Summer Convocation
Friday, June 30	Holiday--no classes scheduled - classes rescheduled to Friday, August 4

July

Friday, July 7	40th class day - Last day to drop one semester courses
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August

Thursday, August 3	Classes rescheduled from Monday, May 22, Monday schedule in effect
Friday, August 4	Classes rescheduled from Friday, June 30, Friday schedule in effect
	Classes conclude
Monday, August 7	Holiday
Thursday, August 10	Examinations commence
Friday, August 18	Examinations conclude
Wednesday, August 23	Last day for grade reports
Friday, September 1	Last date to submit approved thesis for fall graduation
	Last date for application to graduate for fall graduation

II. General Regulations

Includes university-wide policies on admission, registration, graduation, theses, fees and other subjects of importance to graduate students.

Admission

Admission Requirements

In the *Graduate Calendar*, the typical Canadian university curriculum and university system are understood to be the academic standard of reference.

The minimum requirement for admission to a master's program 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). Applicants who hold the DVM degree (or equivalent) and who are applying to the master's program must have achieved an overall average standing of at least second-class honours ('B-' standing) in their program. Standings higher than the minimum 'B-' average are required in some departments for admission to the master's program. Applicants for admission to graduate work whose baccalaureate is not from an honours program or the equivalent and who wish to obtain an honours equivalent degree should direct any enquiries to Admissions Services, Office of Registrarial Services.

Applicants who wish to upgrade their academic qualifications for admission should consult Graduate Program Services, Office of Registrarial Services, for advice on appropriate upgrading procedures prior to applying to a graduate program.

Applicants who believe that their experiential learning may compensate for academic standing which does not meet the university minimum requirements are directed to contact the program(s) of interest regarding availability of alternative admissions criteria.

Admission to doctoral programs normally requires a satisfactory baccalaureate and at least high second-class honours ('B' standing) in a recognized master's degree. Applicants who hold the DVM degree (or equivalent) and who are applying to the DVSc program must have achieved an overall average standing of at least high second-class honours ('B' standing) in their program. Standings higher than the minimum 'B' average are required in some departments for admission to doctoral programs.

Admission, whether as a regular, a provisional, or a special student is, in all cases, based upon the recommendation of the department concerned and is subject to the approval of the dean of Graduate Studies on behalf of the Board of Graduate Studies. Admission to advanced courses of instruction or to the privileges of research does not imply admission to candidacy for a higher degree.

Application for Admission

Potential students may apply: (i) through our on-line application process, (ii) by downloading an application package from our application web site, or (iii) by contacting the graduate secretary in any graduate program to have a package mailed; check with the individual program for application deadline dates. Check our application web site at: <http://www.uoguelph.ca/GraduateStudies/gsmail/index.html> for links to various methods of application procedures. The applicant must assemble all relevant documentation (see below) and any additional program-specific application materials (outlined in the graduate programs section of the *Graduate Calendar*) and forward the complete package to the department to which the applicant is applying.

Transcripts: One certified copy of each previous undergraduate and graduate transcript must be submitted. Applicants from outside North America are strongly urged to attach official statements of the grades obtained and the subject matter included. In instances where only one original transcript is issued, certified copies rather than originals should be submitted.

Letters of Recommendation: Assessment forms from two individuals who are well acquainted with the applicant's education and abilities must be submitted. Academic references are preferred, but former employers are also acceptable referees.

English Proficiency: Courses at the University of Guelph are completed in approximately 12 weeks. Students therefore must be proficient in the use of English, both written and oral, when they begin their studies at Guelph. The university requires that certification of such proficiency be provided by applicants whose first language is not English. Examples of acceptable assessment of proficiency include official scores or results from the Test of English as a Foreign Language (TOEFL) of the Educational Testing Service, the British Council English Language Testing Service (IELTS, also known as the English examination of the University of Cambridge), the Michigan English Language Assessment Battery (MELAB), and the Carleton Academic English Language (CAEL) Assessment. The minimum acceptable score is 550 for the paper-based TOEFL, 213 for the computer-based TOEFL, 6.5 for British Council, 85 for MELAB, and 60 for CAEL. (These minimum acceptable scores are subject to change.) Applicants should make arrangements to take one of these tests at least six to nine months before the opening date of the semester. Other forms of proficiency assessment may apply in individual cases; please contact the admitting department or program for additional information.

Applicants may also choose to enrol in the University of Guelph English Language Proficiency Program which is offered by the Office of Open Learning. Applicants who complete the advanced level of this program will be considered to be eligible to apply to

a graduate program at the University of Guelph. Information on what advanced level constitutes may be found at <http://www.eslguelph.ca/>

Other Academic Examinations: In some departments, Graduate Record Examination (GRE) or Graduate Management Admission Test (GMAT) scores may be used as a basis for determining the acceptability of an applicant. Ample time should be allowed for the results to reach Guelph.

Refusal of Admission

Limitations of funds, space, facilities or personnel may make it necessary for the university, at its discretion, and in spite of the admission requirements set out above, to refuse admission to an otherwise acceptable applicant.

Admission of Faculty Members

Members of the faculty of the university who are:

- senior in rank to a lecturer are not eligible for admission to master's degree studies,
- senior in rank to an assistant professor are not eligible for admission to doctoral studies.

Permission to undertake graduate studies must be obtained from the president of the University of Guelph.

Conditional Admission

Conditional admission may be granted to an applicant whose record to date is acceptable but whose application is incomplete. If the documents are satisfactory when received, the student's admission is confirmed. If they are unsatisfactory, admission is revoked.

Letter of Permission

Persons completing graduate programs at universities outside Ontario for whom it is necessary to complete some course work at the University of Guelph may apply for admission to a non-degree program on a Letter of Permission.

Any such students must complete the normal University of Guelph Application for Admission form. A letter must be submitted to Graduate Program Services by the dean of graduate studies at the student's home university which outlines precisely what the student is expected to complete while at Guelph. This letter must also state that the work completed at Guelph will be a part of the student's program at the home university. No further admission documentation is required.

Students admitted on a Letter of Permission will register as special non-degree students. Students are responsible for requesting that transcripts of work completed at Guelph be sent to their home university.

Ontario Visiting Graduate Student Plan

Ontario universities currently have in place a plan whereby graduate students may take courses at other Ontario universities while remaining registered at their home universities. For information concerning the regulations and procedures involved, interested students are asked to contact the graduate studies office at their home university.

Description of Graduate Students

Graduate students are systematically described by category and by classification.

Category

Regular Student: An applicant who has met the university or program admission requirements, is considered for admission as a regular student.

Provisional Student: An applicant whose qualifications for meeting the minimum university or program requirements appear uncertain, may be considered for admission as a provisional student. This category is unavailable for applicants who clearly do not meet the minimum university admission requirements as assessed by Graduate Program Services. While provisional, the student's program will include at least one graduate course in each semester and may include active involvement in supervised thesis research. If at the end of one semester the department is satisfied with the student's progress, it will recommend to the dean transfer to regular student status. Upon such transfer, the student will receive credit for courses completed. If transfer to regular student status is not achieved at the end of one semester, the student may be permitted to continue for a second semester as a provisional student. At the end of this time, the record will be reviewed as before. If transfer to regular student status is not recommended, the student may be required to withdraw.

Special Student: Students who are not currently registered in a graduate degree or diploma program and who wish to take graduate courses for professional upgrading and/or personal interest should apply to Admissions Services. At the time of application to Admissions Services, the applicant should indicate clearly that they wish to apply as an undergraduate student, and that they are not registered for a graduate degree or diploma at that time. A registered undergraduate student may take a graduate course with the permission of the chair or director of the academic unit offering the course and the permission of the instructor of the course. In certain limited circumstances, graduate courses taken by undergraduate students may be credited to a graduate program at the University of Guelph. See Graduate Program Services for details.

Classification

Students are classified as full-time or part-time on the basis of the program in which they are enrolled. All students have access to university activities and facilities and are expected to take part in the academic life of their program and the university.

Full-time Student

Full-time students apply themselves to their graduate study as a primary responsibility. Normally graduate students will be registered as full-time students because they are registered in full-time programs.

Distant Student

Full-time students may be located away from the university. If the student lives 200 km. or more from Guelph, the student may apply to be full-time distant, which precludes the payment of some non-tuition student fees.

Part-time Student

Part-time students are enrolled in part-time graduate programs. This status must be declared at the time of admission. If a program does not indicate "full-time only", applicants may assume that a part-time option is available. Students interested in part-time study should consult graduate programs of interest to confirm the availability of this option. Part-time students may register for no more than 1.0 course credits in a semester. Three part-time semesters are regarded as the equivalent of one full-time semester in terms of minimum program duration.

In some instances full-time students may be allowed to transfer to part-time if demanding circumstances relating to personal health matters, family responsibilities, or employment exist. Documentation of these circumstances must be submitted to Graduate Program Services on an annual basis.

Pending transfer application and approval from both their program and Graduate Program Services, part-time students may transfer to full-time status at any time in their programs. Full-time graduate students originally admitted to part-time programs may transfer back to part-time status on request.

Registration

Enrolment and Registration

Regular and Provisional Students

Each regular or provisional student will enrol in a program of study in the jurisdiction of one of the following academic units: (a) a single department or school, (b) an interdepartmental committee, or (c) a centre. In each case the student will be identified with a single department in which he or she is deemed to be registered. Normally, the department so identified will be the department of which the advisor is a member. Students enrolled under (b) or (c) above will meet the degree requirements of that unit as arranged with the department in which they are registered.

Special Students

Each special student will register in a single department. The chair of that department, or the chair's nominee, is responsible for the student's program.

Registration Procedure

Students are reminded that registration material must be submitted by the indicated deadlines. Check the Academic Schedule at the front of this calendar for the registration (also known as course selection) deadlines.

Normally six to eight weeks prior to the beginning of each semester, the continuing student will file, in Graduate Program Services, a *Graduate Student Add/Drop & Change* form, in order to activate registration for the upcoming semester. The form must be approved in the academic unit concerned before it is submitted to Graduate Program Services. Alternatively, continuing students (with a few notable exceptions) may choose to use WebAdvisor to register. New students may register through WebAdvisor by mail or in person up until the last date for registration for new students as announced in the Academic Schedule.

University ID cards, which are used for identification and for library and bus pass purposes, are produced and validated at the ID Card Centre, University Centre level 3 upon initial registration. Validation stickers will be provided each semester to registered continuing students. Loss or theft of a university card should be reported at the ID Card Centre.

Normally, the registration procedure must be completed within the dates set in the Academic Schedule in this calendar. In special circumstances a student may be permitted to register up to 14 class days after the opening date with an appropriate late fee being assessed.

Financial statements are available on WebAdvisor following the course selection period for all preregistered students approximately four to six weeks prior to the beginning of each semester. Payment of account by the published deadline will complete the registration process. Late payment will result in the assessment of late fees. Failure to make appropriate payment arrangements by the end of the add period for the semester will result in the cancellation of enrolment (de-registration) for that semester. Reactivation of the term may only be approved with full payment or upon approval of Student Financial Services.

Students wishing to register in any undergraduate course or course for audit must obtain the instructor's signature on the *Graduate Student Add/Drop & Change* form.

Students registered in multi-semester courses must register in *each* semester in which they are actively engaged in course requirements, unless otherwise stated in the course description.

Registration Changes

Changes of registration (deletion or addition of courses) may only be made on the recommendation of the student's advisory committee and with the approval of the dean of Graduate Studies. Credit will be given only for courses listed on the Graduate Student Add/Drop & Change form or authorized through an official change of registration. When dropping two-semester courses, both semesters of the course must be dropped. Students who wish to re-take a two semester course must re-take both parts of the course. The deadline to drop a two-semester course is the add deadline date specified for the second semester of the course.

Continuity of Registration

Students are expected to register in each consecutive semester of study until graduation. They must be registered in each semester in which they are actively engaged in course work or research, including any semester in which they have any contact with university faculty/staff or use of university facilities in connection with their degree program.

Without prior permission from the dean of Graduate Studies, students normally cannot register at the University of Guelph while they are registered as a student at another university. University of Guelph graduate students, with prior permission from the dean of Graduate Studies, may arrange a leave of absence to register at another university. Students should consult Graduate Program Services about the options available when planning such activities.

A regular student may make prior arrangements, subject to review and recommendation by the department, to take a leave of absence from graduate studies for a specified period of time, not to exceed one year. The Board of Graduate Studies may approve a leave of absence for students who request permission not to register for two or more consecutive semesters. Further leave(s) of absence may be granted subject to review and recommendation by the department and approval by the Board of Graduate Studies. A leave of absence approved by the Board of Graduate Studies will include adjustments in the time allotted for completion of the graduate program. Parental leave will be accommodated under this regulation.

The dean of Graduate Studies may routinely approve a leave of absence for students who request permission not to register for one semester, without adjustment to time allotted.

Failure to register or receive prior permission for a leave of absence will be regarded as withdrawal from graduate studies at this university. Students who wish to resume their studies must apply for readmission; if readmitted they will be required to conform to current regulations.

A student who has not completed all the requirements for the degree by the due date for thesis submission in a particular semester must re-register. Candidates must be registered in the semester in which they qualify for the degree.

In the case of conjoint or co-operative graduate programs with other universities, arrangements will be made to ensure that the students involved are not placed at a disadvantage with respect to continuity of registration.

Cancellation of Registration

A student who wishes to withdraw from the university is expected to consult with the department graduate co-ordinator prior to submitting the withdrawal notice to Graduate Program Services. Within the time limits described in , approval of the withdrawal entitles the student to a refund on a prorated basis. No such refund may be claimed without the graduate dean's authorization.

In the event that a student fails to obtain satisfactory standings or to make satisfactory progress either in course work or in research, the Board of Graduate Studies may require the student to withdraw. Registration will be cancelled as of a date specified by the Board and an appropriate refund of fees authorized.

A student who withdraws from the university must return all outstanding loans from the library immediately upon withdrawal, regardless of the original due date. Any items not returned will be declared lost and their cost will be charged to the student's account.

Student Programs

Advisory Committee

In all cases, the student's program of study is established and supervised by the advisory committee. Once the committee has been approved, no changes may be made to its membership without the written approval of the departmental graduate studies committee and the consent of the dean of Graduate Studies.

Establishment of Program

After examining the student's academic record, the committee will arrange a program appropriate for the degree. The committee will give due consideration to relevant courses passed by the student at any recognized university or college and any necessary placement examinations taken. The program will include *prescribed studies* on the basis of which the candidate's final standing will be determined. It may include *additional courses* either chosen by the student or specified by the committee. For master's degrees by course work, OCGS by-laws permit a maximum of 1/3 of the credits to be taken from senior

undergraduate courses; however individual programs may require a higher proportion of graduate courses. The program established by the advisory committee must be submitted for approval to the department graduate coordinator no later than the beginning of the student's third semester.

Changes in Program

Once the program of courses is established, changes may be made, subject to the approval of the advisory committee, and reported to the dean of Graduate Studies.

Transfer of Academic Credit

On the recommendation of the advisor and with the approval of the department chair and the dean of Graduate Studies, a graduate student may take, and receive credit for, graduate courses at another university. The arrangements for these courses must be made through the dean of Graduate Studies or the dean's delegate.

Seminar Courses, Practica and Internships

Either a numeric grade or a designation of satisfactory (SAT) or unsatisfactory (UNS) may be used in evaluating the student's performance in such courses.

Major Paper

In all non-thesis programs, the major paper is assigned a course number and appropriate credits. The course may extend over two semesters and the student's performance may be indicated by a numeric grade or a satisfactory (SAT) or unsatisfactory (UNS) designation. A copy of the major paper must be deposited in the department or school in which the student is registered.

Auditor Privilege

With the consent of the advisory committee, the instructor and the department chair concerned, a student may register for and audit all or part of a course. It is understood that the student will attend lectures as prescribed but will not write any examination or receive any grade. Such a course may be recorded as an additional course, identified by AUD. Note that courses offered through distance education (section DE) may not be audited.

Language of Instruction

The English language is used for instruction, in the writing of examinations, and in text books used at this university (except in modern and classical languages). The thesis and other reports must be written in English.

Short Courses for Graduate Teaching Assistant

Graduate teaching assistants and other graduate students may avail themselves of short courses on specific educational topics offered by Teaching Support Services. Information on the courses offered in the each academic year may be obtained from Teaching Support Services.

Animal Care Instruction

All graduate students who will utilize vertebrate animals in their research and/or who will be teaching assistants in a course involving vertebrate animals must take a short course offered by the Animal Care Committee or have equivalent training. Students must take this course as early as possible in their program. See Animal Care Short Course for details.

Academic Standings

A department may require examinations (oral and/or written), from time to time, to evaluate the student's progress. Numeric grades must be assigned to indicate the student's standing in courses except where otherwise specified

Grades Schedule

In courses which comprise a part of the student's program, standings will be reported according to the following schedule of grades:

- A+ 90-100%
- A 85-89
- A- 80-84
- B+ 77-79
- B 73-76
- B- 70-72
- C+ 67-69
- C 63-66
- C- 60-62
- F 0-59

Grade Interpretation

Course grades help to determine who may or may not continue in a program to completion, to recommend advancement to a subsequent degree, and to determine eligibility for in-program scholarships and possible consideration for awards upon graduation. However, graduate coursework represents a smaller fraction of the student's overall evaluation than do undergraduate course grades. Performance in research is a key component of evaluation at the graduate level.

90-100 (A+)	Outstanding. The student demonstrated a mastery of the course material at a level of performance exceeding that of most scholarship students and warranting consideration for a graduation award.
80-89 (A- to A)	Very Good to Excellent. The student demonstrated a very good understanding of the material at a level of performance warranting scholarship consideration.
70-79 (B)	Acceptable to Good. The student demonstrated an adequate to good understanding of the course material at a level of performance sufficient to complete the program of study.
60-69 (C)	Minimally Acceptable. The student demonstrated an understanding of the material sufficient to pass the course but at a level of performance lower than expected from continuing graduate students.
0-59 (F)	An inadequate performance

A graduate student who receives a grade of less than 60 per cent in any course (graduate or undergraduate, prescribed or additional) is deemed to have failed the course. The advisory committee must then take action. A student may not register for any course they have previously passed unless the course is a varying content course (such as a Special Topics course) or unless so directed by the Admissions and Progress Committee of the Board of Graduate Studies.

AUD	an "audited" course (additional courses only).
INC	incomplete or course not completed. It is required that the INC be replaced by a grade or an INF (incomplete failure) within the next registered semester, within a maximum of two semesters following the semester in which the course was not completed.*
INF	incomplete: failure. Students not completing the course requirements within the prescribed time limit (see INC above) of receiving an INC will receive an INF grade for that course.*
INP	in progress. Multi-semester courses that are in progress will receive the INP interim grade designation in each semester prior to the semester of completion. Students registered in multi-semester courses must register in each semester in which they are actively engaged in course requirements. A grade is recorded in the final semester of offering.
MNR	mark not reported. Grade has not been reported to Graduate Program Services by department or school by the last day for grade reports for the semester. It is required that the MNR be replaced by a grade or an INF (incomplete failure) within the next semester.*
SAT	satisfactory. Used for evaluation of certain seminar and practicum courses
UNS	unsatisfactory, considered a failure. Used for evaluation of certain seminar and practicum courses.
WDF	withdrawn: failure. Identifies a course from which the student withdrew after the announced last date for dropping courses. A course dropped prior to this last date is not recorded.

* Any student who receives an INC or MNR grade and for whom the final grade is not received in Graduate Program Services prior to the first day of the next semester, must be registered within a maximum of two semesters, at the end of which registered semester it is required that the INC be replaced by a grade or an INF (incomplete: failure). If the student is not registered in the semester in which the course is completed, any submitted grade will not be accepted and the student will receive INF as a final grade. Note that the

student does not register for the incomplete course again; when a grade is received, the grade will replace the INC or MNR grade originally recorded. Students who are registered may have, at the department/school graduate committee's discretion, up to the end of that subsequent semester to finish the course requirements before the grade of INF is automatically recorded. Exceptions to the above, for compassionate reasons, may be considered on appeal to the Admissions and Progress Committee of the Board of Graduate Studies.

Thesis Assessment

In the thesis, numeric grades are not required; instead the work is reported as either satisfactory or unsatisfactory.

Prescribed Studies

A graduate student must obtain an overall weighted average of 'B-' or better (at least 70%) in the prescribed studies, as set out in the approved program, in order to qualify for the degree or graduate diploma.

Additional Courses

In the courses which are identified as additional courses, standings will be reported according to the schedule of grades set out above, and will be included in the calculation of the overall average described in Prescribed Studies. It is understood, that such additional courses are an integral part of the student's approved program.

Departmental Review

At the end of each semester the academic record and progress of each student will be reviewed by the graduate faculty of the academic unit in which the student is enrolled and a report therein will be submitted by the advisor to the department graduate co-ordinator and to the student. If the report expresses some concerns about progress or unsatisfactory progress, a copy is submitted to the dean of Graduate Studies. If the student fails a course or a required examination, the advisory committee, through the academic unit, will recommend appropriate action to the Board of Graduate Studies. Only by authority of the board may a further privilege of any kind be extended.

Grounds for Academic Consideration

Academic consideration may be granted on the following grounds:

- medical
- psychological
- compassionate
- misapplication of regulations or procedures
- other special circumstances

Generally, work commitments will not constitute grounds for academic consideration. The necessity for documentation will depend on the situation. Students should contact their Advisor or Graduate Coordinator regarding documentation requirements.

If, due to medical, psychological or compassionate circumstances a student is unable to complete any portion of a course's work, the student should:

1. Inform the instructor-in-charge of the course in writing.
2. If the instructor requests it, supply documentation. If documentation is unavailable, consult your Advisor.
3. Complete and submit missed work by the new deadline established by the instructor.
4. Consult with your Advisor or Graduate Coordinator if you feel that appropriate consideration has not been granted by the instructor.

If the circumstances for academic consideration are such that they could affect a number of courses or completion of other work in the student's graduate program; or if the request for academic consideration involves a misapplication of regulations or procedures, or other special circumstances, the advisor or graduate coordinator should be consulted regarding an appropriate course of action.

If the student cannot reach a mutually agreeable course of action with the advisor or graduate coordinator, as appropriate, the student may discuss the issue with the department chair or the dean of Graduate Studies. See the Dispute Resolution Mechanisms section of the calendar at <http://www.uoguelph.ca/GraduateStudies/calendar/geninfo/geninfo-por-drm.shtml>.

Graduation

Every candidate for an advanced degree is responsible for making application to graduate. The application must be filed when the thesis is submitted at Graduate Program Services or, where a thesis is not required, not later than the last date for thesis submission for the convocation concerned. The graduation list will be based upon these applications.

At the time of application for graduation, master's and doctoral students have the opportunity to choose an alternate degree designation to appear on the graduation diploma. A master's candidate may choose to have "Magisteriate in ..." rather than "Master of ...". A doctoral candidate may choose to have "Doctorate in ..." rather than "Doctor of ...". This designation will appear on the graduation diploma and the official transcript.

On completion of the graduate program, the student's university card must be submitted for invalidation at Graduate Program Services. The invalidated card is then presented at the circulation information desk in the library, where a clearance card is issued. Until

these two steps have been taken, the student will not be eligible for the graduate degree, for a completed transcript, or for a fee rebate (if applicable). At least three working days must be allowed for clearance to be completed by the Division of Circulation and Interlibrary Services, McLaughlin Library.

Transcripts of Record

Certified official transcripts of the student's academic record are available at Graduate Program Services. Only individually sealed copies are valid. Transcripts will be sent to other universities, to prospective employers, or to others outside the university only upon formal request by the student. Application for a transcript should be made at least three working days before it is required.

Thesis

Each candidate for a graduate degree, with some exceptions, is required to submit a thesis based upon the research conducted under the supervision of a member of the graduate faculty. Details as to numbers of copies and arrangements for submission are given under the appropriate degree regulations. General specifications as to paper, format, order and binding are available from Graduate Program Services.

Submission of Thesis

When the thesis, in its final form, has been prepared after the final oral examination, the candidate will bring two unbound copies to Graduate Program Services. Each copy must be submitted in a separate folder with the pages numbered and arranged in the appropriate order. The thesis must be free from typographical and other errors. When accepted by the dean, one copy will be retained for microfilming and for deposit in the McLaughlin Library after being bound. The second copy will be retained for eventual submission to the department.

Circulation and Copying of Thesis

In normal circumstances, as a condition of engaging in graduate study in the university, the author of a thesis grants certain licences and waivers with respect to the circulation and copying of the thesis:

1. to the chief librarian a waiver permitting the circulation of the thesis as part of the library collection;
2. to the university a licence to make single copies of the thesis under carefully specified conditions;
3. to the National Library of Canada a licence to microfilm the thesis under carefully specified conditions.

Provision is made for the circulation and the copying of a thesis to be delayed for a period of up to twelve months from the date of successful final examination, good cause being given.

Copyright Provision

Copies of the thesis shall have on the title page the words "In partial fulfilment of requirements for the degree of Master of Arts" (or Master of Science, etc.). The International Copyright notice (©), which consists of three elements on the same line (a) the letter c enclosed in a circle, (b) the name of the copyright owner (the student) and (c) the year should appear as the bottom line on the title page of the thesis.

Copyright Policy

Consistent with the foregoing, the Board of Governors has established an administrative policy on copyright. The policy statement may be consulted in the Research Policies Handbook at <http://www.uoguelph.ca/research/>

Unacceptable Thesis

In the event that a candidate is unable to prepare a suitable thesis, the advisory committee will so report to the graduate faculty of the department (the candidate will receive a copy of the report). The department chair is responsible for ensuring that the dean of Graduate Studies is promptly and fully informed of the circumstances.

Publications Arising from Research

Graduate students share with other researchers the responsibility of disseminating information obtained in the course of their research. Accordingly, the university encourages graduate students to publish the results of their research projects without undue delay. In several departments, publication of journal articles is critical for their research programs. Such departments may establish procedures whereby the graduate student's advisor may arrange for submission of journal articles based on the graduate student's research, should the graduate student fail to make such submissions. The procedures should be in writing and should be made known to graduate students on entry into the program.

Academic Misconduct

Academic misconduct is behaviour that erodes the basis of mutual trust on which scholarly exchanges commonly rest, undermines the University's exercise of its responsibility to evaluate students' academic achievements, or restricts the University's ability to accomplish its learning objectives.

The University takes a serious view of academic misconduct and will severely penalize students, faculty and staff who are found guilty of offences associated with

misappropriation of others' work, misrepresentation of personal performance and fraud, improper access to scholarly resources, and obstructing others in pursuit of their academic endeavours. In addition to this policy, the University has adopted a number of policies that govern such offences, including the policies on Misconduct in Research and Scholarship and the Student Rights and Responsibilities regulations. These policies will be strictly enforced.

It is the responsibility of the University, its faculty, students and staff to be aware of what constitutes academic misconduct and to do as much as possible through establishment and use of policies and preventive procedures to limit the likelihood of offences occurring. Furthermore, individual members of the University community have the specific responsibility of initiating appropriate action in all instances where academic misconduct is believed to have taken place. This responsibility includes reporting such offences when they occur and making one's disapproval of such behaviour obvious.

University of Guelph students have the responsibility of abiding by the University's policy on academic misconduct regardless of their location of study; faculty, staff and students have the responsibility of supporting an environment that discourages misconduct. Students should also be aware that if they find their academic performance affected by medical, psychological or compassionate circumstances, they should inform the appropriate individuals (instructors, program counsellors, graduate advisors) and follow the available procedures for academic consideration outlined in the University's calendars.

Education and Remediation

Education and remediation are key to promoting an environment in which academic integrity will flourish. It should not be possible for a student to claim that he/she was not warned about the University's academic misconduct regulations, what constitutes academic misconduct and the potential consequences of transgressing. The need to educate students about academic integrity places a particular responsibility on faculty, especially with respect to discipline-specific issues.

The University's Strategic Directions place high value on collaboration and co-operation in the learning process, across disciplines and between institutions. Further, the strategic plan recognizes the importance of students learning to work with others in group projects and situations as key to developing skills as self-reliant learners. This is reflected in the large number of courses at this University which involve group work and encourage co-operation in completing assignments. However, there may be need to limit the amount of collaboration or co-operation. Students need to be aware of, and instructors need to be clear about assignments for which discussing or completing the work with others is not appropriate and where the expectation is that students will work separately. Instructors should be very explicit about expectations with respect to academic integrity, and information with respect to academic misconduct should be presented to students as part of the course outline, academic program orientation materials and other materials posted and distributed to students. Students need to remain aware that instructors have access to and the right to use electronic and other means of detection.

In addition, in the case of examinations, students should be sure that they read and understand the regulations with respect to conduct in examinations printed on the cover of each examination booklet, and should pay particular attention to any additional instructions from the examination invigilators.

In support of remediation, students convicted of an academic offence may be required to successfully complete an academic integrity remediation process.

Note: In this policy, the word "dean" means "dean or designated associate dean." The word "chair" means "chair of a department or director of a school." The word "department" means "department or school."

Offences

Academic misconduct is broadly understood to mean offences against the academic integrity of the learning environment.

Below are descriptions of academic offences. It is important to note that, while the University has attempted to present as comprehensive a list as possible, this list of potential academic offences should not be considered exhaustive. Students are responsible for knowing what constitutes an academic offence and faculty members have a responsibility to provide students, early in their course or program, with information about academic integrity that might be particular to their discipline. An offence may be deemed to have been committed whether the student knew a particular action was an offence or ought reasonably to have known. Whether or not a student intended to commit academic misconduct is not relevant to a finding of guilt. Hurried or careless submission of assignments does not excuse students from responsibility for verifying the academic integrity of their work before submitting it. Students who are in any doubt as to whether an action on their part could be construed as an academic offence should consult with a faculty member or faculty advisor.

It is the responsibility of students working in a group to take all reasonable steps to ensure that work submitted to the group by individual members has not been completed in a way that violates this policy.

Further, as some academic offences may also be viewed as violations of policies on Misconduct in Research and Scholarship, the Student Rights and Responsibilities regulations, the criminal code and/or civil statutes, students may also be subject to procedures and penalties outlined in those policies at the University's discretion, and to criminal prosecution or civil action.

A graduate of the University may be charged with an academic offence committed while he/she was a registered student when, in the opinion of the dean, the offence, if detected, would have resulted in a sanction sufficiently severe that the degree would not have been granted at the time that it was.

1. Misappropriation of Other's Work

1. Plagiarism

Plagiarism is misrepresenting the ideas, expression of ideas or work of others as one's own. It includes reproducing or paraphrasing portions of someone else's published or unpublished material, regardless of the source, and representing these as one's own thinking by not acknowledging the appropriate source or by the failure to use appropriate quotation marks. In addition to books, articles, papers and other written works, material may include (but is not limited to): literary compositions and phrases, performance compositions, chemical compounds, art works, laboratory reports, research results, calculations and the results of calculations, diagrams, constructions, computer reports, computer code/software, and material on the internet. Some examples of plagiarism include:

- submission of a take-home examination, essay, laboratory report or other assignment written, in whole or in part, by someone else;
- using direct, verbatim quotations, paraphrased material, algorithms, formulae, scientific or mathematical concepts, or ideas without appropriate acknowledgment in any academic assignment;
- using another's data or research findings;
- buying or selling term papers or assignments;
- submitting a computer program developed in whole or in part by someone else, with or without modifications, as one's own;

Students have the responsibility to learn and use the conventions of documentation suitable to the discipline, and are encouraged to consult with the instructor of the course, the academic supervisor, or the department chair for clarification if needed. Instructors should include in the materials they provide to students about academic integrity, information about any unique, discipline-specific understandings with respect to what must be acknowledged or cited¹.

2. Copying

Copying is similar to plagiarism in that it involves the appropriation of others' work as one's own. It includes copying in whole or in part another's test or examination answer(s), laboratory report, essay, or other assignment.

Copying also includes submitting the same work, research or assignment for credit on more than one occasion in two or more courses, or in the same course, without the prior written permission of the instructor(s) in all courses involved (including courses taken at other post-secondary institutions).

3. Unauthorized Co-operation or Collaboration

It is an offence to co-operate or collaborate in the completion of an academic assignment, in whole or in part, when the instructor has indicated that the assignment is to be completed on an individual basis.

¹ In addition to being concerned about appropriate citation, students who wish to use the work of others, from any source, should be aware of copyright laws and other conventions governing intellectual property. See the Office of Research website, <http://www.uoguelph.ca/research/policies/index.shtml> for links to the University's intellectual property policies.

2. Misrepresentation and Fraud

This category of offences covers a range of unacceptable activities, including the following:

1. Impersonation

Impersonation involves having someone impersonate oneself, either in person or electronically, in class, in an examination or in connection with any type of academic requirement, course assignment or material, or of availing oneself of the results of such impersonation. Both the impersonator and the individual impersonated (if aware of the impersonation) are subject to disciplinary proceedings under this policy.

2. Falsification

It is an offence to submit or present false or fraudulent assignments, research, credentials, or other documents for any academic purpose. This includes, but is not limited to:

- falsified research or lab results and data;
- concocting facts or reference;
- false medical or compassionate certificates;
- false letters of support or other letters of reference;
- falsified academic records, transcripts or other registrarial records;
- fraudulent submission practices (e.g., altering date stamps);
- altering graded work for re-submission.

It is also falsification to misrepresent the amount of work an individual has contributed to a group assignment or activity. Both the individual to whom work is falsely attributed and those who acquiesce in its attribution commit an academic offence.

3. Withholding

It is an offence to withhold records, transcripts or other academic documents with the intent to mislead or gain unfair academic advantage.

4. Unauthorized Aids and Assistance

It is an offence to use or possess an unauthorized aid, to use or obtain unauthorized assistance, or to use or obtain prohibited material in any academic examination or term test or in connection with any other form of academic work. Such aids or material may include, but are not limited to, specific documents, electronic equipment or devices, and commercial services (such as writing, editorial, software, or research survey services). Students should assume that any such aid is prohibited unless they are specifically advised otherwise by the instructor or invigilator. Note that unauthorized assistance does not include student support services offered by the University, such as the Learning Commons.

3. Improper Access and Obstruction

1. Preventing Access to Materials

It is an offence to alter, destroy, hide, remove without authorization, or in any other way improperly restrict access to library, electronic or other materials intended for general academic use.

2. Obstruction and Interference

It is an offence to obstruct or otherwise interfere with the scholarly activities of another, or to alter or falsify the work of others, in order to gain unfair academic advantage. This includes, but is not limited to, deleting data or files, interfering or tampering with experimental data, with a human or animal subject, with a written or other creation (for example, a painting, a sculpture, a film), with a chemical used for research, or with any other object of study or research device.

3. Improper Access

It is an offence to improperly obtain through theft, bribery, collusion, or otherwise access to confidential information, examinations or test questions or to gain undue academic advantage as a result of such behaviour.

4. Improper Dissemination

It is an offence to publish, disseminate or otherwise make public to a third party without prior written consent, confidential information. Confidential information includes but is not limited to academic information, data or documents which are not otherwise publicly available and which have been gathered or held with a reasonable expectation of confidentiality.

4. Aiding and Abetting

Knowingly aiding or abetting anyone in committing any form of academic misconduct is itself academic misconduct and subject to this policy.

Penalties

A. Range of Penalties That May be Assessed

If a student is found guilty of academic misconduct, an Official Warning will be given that an offence is now noted in the student's record and that a subsequent offence will attract a more severe penalty. In addition, one or more of the following penalties may be assessed:

1. A requirement for submission of a new or alternative piece of work.
2. The rescinding of University-funded scholarships or bursaries.
3. Partial or total loss of marks on the examination or assignment in which the offence occurred.
4. Partial or total loss of marks for the course in which the offence occurred.
5. Suspension from the University for a period of between one and six consecutive semesters. For the period of suspension, a student will not be permitted to register and will retain none of the privileges accorded to students with respect to right of access to University faculty, staff, facilities or services.
6. A recommendation for expulsion from the University.
7. A recommendation for revocation/rescinding of a degree. A person who is found guilty of academic misconduct after having been approved for graduation, or after having a degree conferred, may have the degree rescinded or revoked when, in the opinion of the dean, the offence, if detected, would have resulted in a sanction sufficiently severe that the degree would not have been granted at the time that it was.

B. Notes with Respect to Penalties

The following should be noted with respect to penalties:

1. Senate has approved a set of Guidelines for the Assessment of Penalties for Academic Misconduct. These guidelines are used by chairs/directors and deans to assist them in determining appropriate penalties for individual cases. A copy of the guidelines can be found in the Graduate Calendar, or may be obtained from the Senate Office or the office of any chair or dean.
2. Students who have been found guilty of a course-based offence and who have been assessed a penalty in addition to an Official Warning will not be permitted to drop the course or to withdraw with failure. A student who has dropped the course prior to the offence(s) being detected will have his/her enrolment in the course reinstated if found guilty and if the penalty assessed is other than an Official Warning.

3. Students who have been suspended for academic misconduct will not receive credit for any courses taken while under suspension. This policy applies to any credit course taken during the suspension period, be it distance, or non-campus, taken in open learning programs at the University of Guelph or at another post-secondary institution. In addition, in the case of graduate students, any research or writing completed during the suspension period may not be submitted in fulfillment of program requirements once the period of suspension is concluded.
4. A student who wishes to be considered for readmission after a suspension must make an application that will be judged on the basis of eligibility to continue. A student who is suspended for academic misconduct and also fails to meet the continuation of study requirement will normally be required to serve the associated penalties consecutively.
5. A student who has been expelled from the University of Guelph is not eligible for readmission to the University for at least five years. A student who wishes to be considered for readmission must petition the President to have the expulsion status removed. The President will form a hearing committee to review the case for lifting the admission restriction. If the committee decides to remove the expulsion status, the student who wishes to be considered for readmission must then make an application that will be judged on the basis of eligibility to continue. If the committee decides to leave the expulsion status in place, the student must wait at least another two years before submitting a new petition.
6. Penalties may be applied retroactively if an offence is discovered subsequent to completion of a course or after graduation.

Procedures

A. Notes Re: Procedures and Authority to Act

1. Deans may delegate their authority under this policy to an appropriate designate(s). Such delegation may be full (for example, all cases are delegated to an Associate Dean), or partial (for example, authority with respect to offences related to course work may be delegated to departmental chairs). Deans must provide the University's Judicial Officer with the name(s) of individual(s) to whom authority has been delegated under this policy.
2. For offences related to course work (including examinations):
 - a. The designate of the Director of Open Learning will carry out the role of the chair in cases where the offence has been committed in an Open Learning, non-degree credit course. Degree credit courses offered through distance are within the authority of the chair of the department offering the course. The role of the dean in the case of non-degree credit courses offered through the Open Learning program is carried out by the Director of Open Learning.
 - b. For undergraduate students and open learners, the relevant dean is the dean of the college in which the course is offered, and the dean of the college in which the student is enrolled (if different) should receive a copy of the decision. In the event that an offence is committed in a degree credit course by an open learner, the Director of Open Learning should receive the copy of the decision.
 - c. For graduate students, the relevant deans are the dean of the college in which the course is offered and the Dean of Graduate Studies acting jointly. The dean of the college in which the student is enrolled (if different) should receive a copy of the decision.
3. For offences not related to courses, or for course offences involving students not enrolled in the course, for undergraduate students the dean of the college in which the student is enrolled is responsible for administering the policy. For graduate students, the policy is administered jointly by the Dean of Graduate Studies and the dean of the college in which the student is enrolled.
4. In the event that a chair/director has a conflict of interest in dealing with a case, the dean will appoint another faculty member to deal with the case. In the event that a dean's designate has a conflict of interest in dealing with a case, the dean may appoint an alternate designate or choose to deal with the case himself/herself. In the case of a conflict of interest on the part of a dean, the Provost will appoint a designate to deal with the case.
5. Wherever in this policy it states that a student is to be contacted, the normal expectation is that such contact will be made using the student's University of Guelph email account, with a copy of any correspondence being sent to the home address provided to the University by the student.

B. Detection and Documentation

1. Examinations

The responsibility for preventing and detecting academic misconduct in an examination lies with the invigilators, although they make use of reports from others to assist them in detection. In cases of suspected impersonation, the chief invigilator shall require the student concerned to remain after the examination until the student is satisfactorily identified. In other cases of suspected academic misconduct, the chief invigilator shall allow the student to complete the examination, but:

- may require that the student complete the examination in another location or setting when it is deemed that such action will cause the least disruption of those taking the examination; and

- shall confiscate any suspect material (including those portions of the examination completed to that point) and give it, along with the student's other examination booklet(s) (collected at the end of the exam) to the instructor immediately following the examination.

The chief invigilator shall give a full report, together with any confiscated material, to the instructor-in-charge of the course if the instructor is not the chief invigilator. In instance of open learning courses, the material will be submitted to the Director of Open Learning. The student is required to contact the instructor no later than the end of the examination period.

2. Term assignments, including research and thesis work

The initial responsibility for detecting academic misconduct on term assignments, etc., necessarily lies with the person(s) responsible for evaluation and discussion of the student's work, although that person may make use of reports from others to assist in detection, and may make use of electronic means of detection appropriate to the discipline. Where academic misconduct is suspected, the evaluator/marker shall retain possession of any suspect material and give a full report in writing together with any confiscated material to the instructor-in-charge of the course, or to the student's advisor, if the instructor/advisor is not the evaluator/marker. At this stage, the student will be informed by the instructor/advisor that a suspicion of academic misconduct is being investigated.

3. Cases outside the domain of examinations or assignments

The responsibility for detecting academic misconduct in the context of an academic environment that is not part of the formal examination or assignment process rests with the entire University community. Where academic misconduct is suspected, but where it is unclear whether it is directly related to a specific course, or where the specific course is unknown, those with knowledge of an offence should contact the dean of the college in which the student is enrolled and the Dean of Graduate Studies in the case of a graduate student. If the suspected offence appears to be related to a specific course, then the instructor of the course should be contacted.

C. Investigation and Judgment

1. Offences Related to Course Work, Research, Thesis Work or Examinations

- a. When an instructor or an advisor suspects that an academic offence has been committed, he/she is responsible for gathering evidence to support or allay the suspicion and may invite the student to meet with him/her to discuss the concerns. The instructor/advisor should pursue the gathering of evidence in a timely way. The normal expectation for assignments due within the semester is that instructors/advisors will complete their evidence gathering within ten working days of the due date for the assignment. For assignments submitted at the end of the semester or during the examination period, the instructor has until the tenth day of the subsequent semester to collect the evidence and determine whether to pursue a case. In a case where an instructor/advisor requires substantial additional time to collect and review the evidence, he/she may seek an extension of time from the chair.
- b. If after reviewing the available evidence the instructor/advisor believes an offence may have been committed, he/she shall refer the case to the chair of the department responsible for the course or graduate program. The referral document will include all evidentially material collected by the instructor/advisor along with the transmittal form on which the instructor/advisor may include a recommendation with respect to penalty should the allegation be upheld. A copy of the first page of the transmittal form shall be sent to Undergraduate Program Services/Graduate Program Services by the chair.
- c. If the chair believes that there is sufficient evidence to support a charge of academic misconduct, he/she will forward the transmittal form and all evidentiary material to the dean/dean's designate, normally within ten working days of receipt of the allegation from the instructor/advisor.
- d. Normally within ten working days of receipt of the case from the chair, the dean will invite the student to meet with him/her to discuss the allegation(s). If the student does not respond within ten working days to the request for an interview, or if the student refuses to attend an interview, the dean may proceed with the case. The student may be accompanied at the meeting by a support person. Prior to meeting with the student, the dean may consult with any individuals he/she believes pertinent to the case. At the meeting, the student will be presented with the evidence collected by the dean to that point. Based on the student's response to the evidence, the dean may engage in further consultation with any individuals he/she deems pertinent to the case. The student will be informed of any other evidence gathered as a result of those consultations and be given an opportunity to respond prior to the dean's reaching a decision on the case.
- e. If after weighing the available evidence the dean finds an offence has been committed, the dean will contact Undergraduate Program Services/Graduate Program Services as appropriate to determine whether this is a first offence.
- f. In determining the appropriate penalty, the dean will consult the Guidelines for Penalties for Academic Misconduct, will take into consideration the recommendation from the instructor/advisor, and consider such factors as the relative weight of the assignment, the semester level of the student, any record

of previous offences, the seriousness of the offence (e.g. the amount of work plagiarized), and any mitigating circumstances presented by the student. For graduate students, attention will also be paid to whether the work in which the offence has been committed is one of the major milestones of the graduate program (e.g., qualifying examination, thesis).

- g. Normally within ten working days of the meeting with the student, or ten days from the date of the final communication with the student with respect to any additional evidence, the dean will inform the student in writing of the disposition of the case. In a case where the dean requires substantial additional time to review the evidence and come to a judgment, she/he may seek an extension of time from the Provost.

Should the dean determine that an academic offence has not been committed he/she shall so inform the student, the instructor/advisor and the chair in writing. A copy of the letter will be forwarded to Undergraduate Program Services/Graduate Program Services as appropriate. Thereafter, the complaint shall have no official status as an accusation of academic misconduct and no record of the complaint shall be maintained on the student's record.²

Should the dean determine that an academic offence has been committed, he/she shall inform the student in writing. The written notification should include the offence for which the student has been found guilty and information with respect to penalty. Copies of the written notification should be sent to any other relevant dean(s) office(s), to the instructor/advisor, the department chair, the program counsellor and to Undergraduate Program Services/Graduate Program Services (as appropriate).

- h. In a case where the dean believes suspension or a recommendation for expulsion/revocation is warranted, he/she should consult with the Provost and Vice-President Academic before making a final determination with respect to penalty.
- i. Should the dean recommend expulsion or revocation/rescinding of a degree, he/she shall so inform the student in writing and forward the matter to the Senate Committee on Student Petitions.

At that time, the student may appeal the recommendation of expulsion/revocation and request a hearing of the Senate Committee on Student Petitions. Whether or not a hearing is requested, the Senate Committee on Student Petitions will proceed with the case and inform the parties involved of its decision.

In the case of an expulsion, the Senate Committee on Student Petitions may decide to uphold the recommendation to expel, in which case the recommendation will be forwarded to the President for final decision. Alternatively, the Senate Committee on Student Petitions may decide to impose a lesser penalty, in which case the President's assent is not required. When a recommendation is referred to the President, the President may uphold the recommendation to expel or impose a lesser penalty, which will be final.

In the case of revocation/rescinding of a degree, if the Senate Committee on Student Petitions confirms the recommendation of rescinding/revocation of a degree, the recommendation will be forwarded to the President. If the President does not confirm the recommendation of rescinding/revocation of a degree, the President may impose a lesser penalty, which will be final. If the President confirms the recommendation, the recommendation will be forwarded to Senate for final decision with respect to revocation/rescinding. If the Senate does not confirm the recommendation of revocation/rescinding, the matter will be returned to the President for a final decision with respect to a lesser penalty.

² A statistical record will be kept by the Office of the Dean for annual reporting purposes.

2. Other Offences

- a. Cases involving offences that are not course-related or are not related to graduate program work are dealt with by the relevant dean (see Procedures A. Notes Re: Procedures and Authority to Act). Examples of such offences include, but are not limited to falsification of credentials for admission purposes, damaging of library materials, abetting the cheating of another in a course in which the abettor is not enrolled, and obstructing or interfering with the academic activities of others.
- b. When a case is brought to the attention of the dean, the dean shall inform the student that an allegation has been made and invite the student to meet to discuss the allegation. The dean will also inform Undergraduate Program Services/Graduate Program Services (as appropriate). If the student does not respond within ten working days to the request for an interview or refuses to attend an interview, the dean may proceed with the case. The student may be accompanied at the meeting by a support person. Prior to meeting with the student, the dean may meet with any individuals or collect evidence as he/she deems pertinent to the case. At the meeting, the student will be presented with the evidence collected by the dean to that point. Based on the student's response to the evidence, if necessary the dean may consult with any other individuals he/she deems pertinent to the case. The student will be informed of any other evidence gathered as a result of those consultations and be given an opportunity to respond prior to the dean's reaching a decision on the case.

- c. If after weighing the available evidence the dean finds that an offence has been committed, the dean will contact Undergraduate Program Services/Graduate Program Services as appropriate to determine whether this is a first offence. The dean may impose penalties in accordance with Penalties A. and B., above. In the event that the dean believes suspension, expulsion or revocation to be warranted, he/she shall proceed as in Procedures C.1. (h) and (i).
- d. Normally within ten days of meeting with the student, or of the final communication with the student with respect to evidence, the dean shall inform the student in writing of his/her decision in the case, and copy the letter to the relevant university officials, including Undergraduate Program Services/Graduate Program Services (as appropriate). In a case where the dean requires substantial additional time to gather evidence and make a judgment, he/she may seek an extension from the Provost and Vice-President Academic.

Appeals

- Students may appeal either the finding, the penalty, or both to the Senate Student Petitions Committee.
- Appeals must be submitted to the Senate Student Petitions Committee within 15 working days of receipt of the decision. If the decision is mailed, it will be deemed to have been received by the student the fifth day after it has been mailed. If the decision is sent by courier, fax or email it shall be deemed to have been received one day after it has been sent.
- An appeal to the Senate Committee on Student Petitions involves an examination of all relevant documents and evidence to determine the appropriateness of a finding of guilt or of the assessed penalty. The procedures for conducting an appeal and for holding a hearing are set out in the Regulations of the Senate Committee on Student Petitions. Following an appeal or hearing, the Senate Committee on Student Petitions may take one or more of the following courses of action:
 - confirm a finding of guilt;
 - reverse a finding of guilt (in which case no penalty shall apply);
 - confirm a penalty;
 - assess a different penalty.

Record of Academic Misconduct

Undergraduate Program Services, or the Dean of Graduate Studies, or the Director of Open Learning as appropriate, shall place in the student's file a record of all academic misconduct for which the student is penalized. Students in the Associate Diploma Program who are found guilty of academic misconduct in an Independent Study course taken through OAC Access towards their Associate Diploma will have the record of the finding of guilt placed against the appropriate term.

The record of academic misconduct shall be expunged from the student's file upon graduation, or for open learners, upon completion of a certificate or diploma. Students who do not graduate from the University of Guelph or another university may submit an application to the Senate Committee on Student Petitions to have the record expunged no sooner than five years after the date of last registration. Students who have graduated at another accredited university may submit verification of graduation to Undergraduate Program Services/Graduate Program Services and have their record expunged. The record for expulsion is permanent, unless removed by petition to the President.

Access to the record of academic misconduct will be limited to those involved in processing appeals and those involved in processing additional complaints against the student.

Note: Template letters to students, forms for Undergraduate Program Services and Graduate Program Services, and suggested wording for course outlines are available on the following site: <http://www.uoguelph.ca/senate/policies.shtml>.

Guidelines for Penalties for Academic Misconduct

With the finding of academic misconduct, there is a mandatory penalty of **Official Warning** which will stay on the student's record until graduation. In addition, one or more other penalties may be assessed. Following are guidelines used by chairs/directors and deans in determining the appropriate additional penalties. Users need to be aware that these are guidelines and that not all cases will fit neatly into the categories.

The guidelines below provide a range of penalties (minima and maxima) for the various offences identified in the Policy on Academic Misconduct as well as indicate what penalty is deemed to be the "norm" for the offence in the case of a first or second year student. It should be noted that "subsequent offence" means any subsequent offence, not only a subsequent offence in the same category.

For a course-based offence, the chair/director may assign penalties up to and including loss of grades if the offence is a first offence. If there is a previous offence on the student's record, or if the chair/director believes a stronger penalty is merited, the case is forwarded to the dean for penalty assessment.

In cases where the dean is of the opinion that there is cause for a penalty different from those indicated in the guidelines (either higher or lower), she/he will review the penalty with the Provost and Vice-President Academic. The dean will also consult with the Provost in cases where the contemplated penalty is suspension or expulsion.

In a case where the dean is of the opinion that the finding of guilt is not supported by the evidence, the dean will review the case with the chair/director. If the chair/director and

dean are unable to reach an agreement on the case, the dean will consult with the Provost before making final determinations as to the finding of guilt and any penalty to be applied in the event that dean upholds the finding of guilt.

In determining the appropriate penalty the chair/director or dean will take into consideration these guidelines, the recommendation from the instructor, the recommendation from the chair/director (in the case of a dean assigning a penalty), and any other relevant factors such as the relative weight of the assignment, the semester level of the student, the seriousness or extent of the offence (e.g. the amount of work plagiarized), any record of previous offences, and any mitigating circumstances presented by the student.

Guidelines for Penalties for Academic Misconduct in Addition to Official Warning

Offences	First Offence	Subsequent Offences
A. Misappropriation of Other's Work		
1. Plagiarism		
Minor	Resubmission of new work Loss of grades³ Zero on the assignment	Loss of grades Zero on the assignment Zero in the course Loss of scholarship/bursary Suspension
Major	Zero in the course Loss of scholarship/bursary Suspension	Zero in the course Loss of scholarship/bursary Suspension Expulsion/Revocation
2. Copying		
Minor	Resubmission of new work Loss of grades Zero on the assignment	Loss of grades Zero on the assignment Zero in the course Loss of scholarship/bursary Suspension
Major	Zero in the course Loss of scholarship/bursary Suspension	Zero in the course Loss of scholarship/bursary Suspension Expulsion/Revocation
3. Unauthorized Collaboration		
Minor	Resubmission of work Loss of grades Zero on the assignment	Loss of grades Zero on the assignment Zero in the course Loss of scholarship/bursary Suspension
Major	Zero in the course Loss of scholarship/bursary Suspension	Zero in the course Loss of scholarship/bursary Suspension Expulsion/Revocation
B. Misrepresentation and Fraud		
1. Impersonation		
Minor	Zero on the assignment Zero in the course Loss of scholarship/bursary Suspension	Zero in the course Loss of scholarship/bursary Suspension
Major	Zero in the course Loss of scholarship/bursary Suspension	Zero in the course Loss of scholarship/bursary Suspension Expulsion/Revocation
2. Falsification		
In addition to any penalty that may be applied, if a document is discovered to have been falsified, the document is null and void and the action permitted by the document is reversed.	Resubmission of work Loss of grades Zero on the assignment Zero in the course⁴ Loss of scholarship/bursary Suspension/revocation of admission offer	Zero in the course Loss of scholarship/bursary Suspension/revocation of admission offer Expulsion/Revocation
3. Withholding of documents		

Minor	Official warning Loss of grades Resubmission of work Zero on the assignment	Zero in the course ⁵ Loss of scholarship/bursary Suspension Expulsion/Revocation of degree or admission offer
Major	Zero in the course Loss of scholarship/bursary Suspension Expulsion/Revocation of degree or admission offer	Zero in the course Loss of scholarship/bursary Suspension Expulsion/Revocation of degree or admission offer
4. Unauthorized Aids		
	Resubmission of work Loss of grades Zero on the assignment/exam	Zero in the course Loss of scholarship/bursary Suspension Expulsion/Revocation
C. Improper Access and Obstruction ⁶		
1. Preventing Access		
Minor	Official warning Resubmission of work Loss of grades Zero on the assignment	Zero in the course Loss of scholarship/bursary Suspension
Major	Zero in the course Loss of scholarship/bursary Suspension	Zero in the course Loss of scholarship/bursary Suspension Expulsion/Revocation
2. Obstruction and Interference	Loss of grades Zero on the assignment Zero in the course Loss of scholarship/bursary Suspension	Zero in the course Loss of scholarship/bursary Suspension Expulsion/Revocation
3. Improper Access	Zero in the course Loss of scholarship/bursary Suspension Expulsion/Revocation	Zero in the course Loss of scholarship/bursary Suspension Expulsion/Revocation
4. Improper Dissemination	Zero in the course (if applicable) Suspension	Zero in the course Loss of scholarship/bursary Suspension Expulsion/Revocation

³ Bolded text indicates the normal expectation for penalty for a first or second year undergraduate, or first year graduate student.

⁴ If the falsified document is course-related (e.g. medical note).

⁵ If the withheld information would have affected admission to a course.

⁶ These offences may also be subject to penalty under the Student Rights and Responsibilities Policy.

Grade Reassessment

Grade reassessment is the process of reviewing the calculation of grades, or the methods and criteria used to establish final grades, or the application of academic regulations or procedures in course grading. The outcome of a grade reassessment may be a grade increase, a grade decrease, or no change to the grade. The detection of errors or omissions in the calculation of final grades will result in the assignment of a revised grade. Students normally initiate grade reassessments, but instructors may initiate this process. In the event that the reassessment results in a change in grade, the department chair may arrange for the review of the grades of other students in the course and ensure that other grades are changed, if necessary.

Calculation Errors or Omissions

Students who believe there have been errors or omissions in the calculation of their final grade for a course may request a grade reassessment. They must submit a request in writing to the chair of the department offering the course within 14 working days of receiving notification of the grade. The request must pertain to work completed in the course and must contain a statement of the specific reasons why the grade does not adequately reflect academic performance in the course. Students must also submit relevant assignments or tests that have been returned to them. The chair shall forward the student's request to the instructor and the instructor shall respond to the chair within one week. The instructor has the responsibility of reviewing the appropriateness of the assigned grade in relation to the student's work, and of ensuring that the calculation of marks is accurate. The instructor must reply to the chair, in writing, giving assurance that the review is complete.

If there is a change in the grade, the chair will forward a Grade Reassessment form to the college dean. Upon approving the grade change, the dean signs the form and forwards it to Graduate Program Services. Graduate Program Services will advise the student in

writing of the change of grade. If there is no change to the grade, it is the chair's responsibility to inform the student in writing.

Methods or Criteria Used in Establishing Final Grades

The course outline distributed to the class at the beginning of the semester defines the methods and criteria used in establishing final grades for a course. The methods and criteria must conform to the grading procedures established by Senate.

A student who believes that the methods or criteria used by an instructor in determining a final grade are unfair, unreasonable or inconsistent with the course outline, must request the chair of the department offering the course to review the methods or criteria used. The student must submit the request in writing within 14 working days of receiving notification of the grade and must state the reasons for the request.

The chair shall attempt to resolve the matter to the satisfaction of both parties. Both the instructor and the chair are free to discuss the student's work with the student or another instructor in the department, but are not obliged to do so. The student, instructor, or chair of the department may request an internal or external assessor who shall be identified by mutual agreement between the instructor and the student. If agreement as to the assessor cannot be reached within 10 working days, the chair shall notify the dean of the College, who shall select the assessor in consultation with the parties.

If both parties are able to come to an agreement, the chair shall prepare a statement of the agreement to be signed by both parties. If the agreement results in a change to the grade of the student, the chair shall send a copy of the statement to the college dean who shall inform Graduate Program Services.

If at any time the chair decides that the matter cannot be resolved informally, he or she will terminate all efforts at reconciliation and notify both the student and the instructor of this decision in writing. Results of any internal or external assessment must be included. The chair will advise the student that an appeal can be made to the Senate Committee on Student Petitions. The student must appeal to the committee within 10 working days of being advised of the termination of the chair's efforts. In cases where the student, instructor, or chair of the department has requested an internal or external assessment of the student's work, the materials submitted to the Petitions Committee must include a copy of the internal or external assessment obtained by the chair.

Misapplication of an Academic Regulation or Procedure

Students who believe that the misapplication of an academic regulation or procedure has affected their final grade in a course, must discuss their concern with the instructor. If the concern is not resolved to their satisfaction they may submit a complaint in writing to the chair of the department offering the course within 14 working days of receiving notification of the grade.

If the chair has reason to believe that the instructor has not adhered to the grading procedures established by Senate or other academic regulations of Senate, the chair will consult with the faculty member and, if necessary, the college dean, to resolve the matter. If the matter cannot be resolved the chair will advise the student that the student can appeal to the Senate Committee on Student Petitions within 10 working days.

Unsatisfactory Progress

When it is necessary for action to be taken with respect to unsatisfactory performance by a graduate student, the following process applies. The advisory committee makes a recommendation to the department graduate studies committee which forwards a recommendation to Graduate Program Services. The dean of Graduate Studies ensures that the student is aware of the department's recommendation and is offered the opportunity to make a submission. The recommendation of the department and any submission from the student are considered by the Admissions and Progress Committee of the Board of Graduate Studies. The Admissions and Progress Committee makes a decision on behalf of the Board of Graduate Studies.

At any stage of the above process, a graduate student may request a reconsideration. It is hoped that communication with the advisor, the chair of the departmental graduate studies committee and the Admissions and Progress Committee will be forthright and constructive.

Appeals of Decisions

Circumstances may arise in a graduate student's program where requests for changes are considered by the Admissions and Progress Committee of the Board of Graduate Studies. Examples are requests for extended leaves of absence and requests for the removal of course records. In the event of a negative decision, the graduate student may, within 14 days of notification of the decision, request re-evaluation by the Admissions and Progress Committee. Such a request should be accompanied by any information not previously available to the committee. If the negative decision is maintained, the student may, within 90 days of notification of the decision, appeal to the Senate Committee on Student Petitions. The decision of the Senate Committee on Student Petitions is final.

In the event of a decision by the Admissions and Progress Committee that the student be required to withdraw, the graduate student may, within 90 days of receiving notification of the decision, appeal to the Senate Committee on Student Petitions. Details concerning appeals may be obtained from the secretary of Senate. The decision of the Senate Committee on Student Petitions is final.

Senior Undergraduates in Graduate Courses

Under exceptional circumstances a senior registered undergraduate student may take a graduate course with the permission of the chair or director of the academic unit offering the course and the permission of the course instructor. The graduate course may be used as credit toward an undergraduate honours degree, with the permission of the chair of the department responsible for the undergraduate program. The course may not be used as a credit toward a future graduate program at the University of Guelph.

Inventions Policy

In the course of completing their degree requirements, undergraduate or graduate students may discover, or help discover, technology which might be patentable and/or have the possibility for commercial development. Any students who suspect this might be the case should, without delay, contact their research advisor, if appropriate, and the Office of Research. Although the rights to such inventions are owned by the university, a student who is an inventor or co-inventor would share in any revenues earned by the invention according to the university's Inventions Policy.

III. General Information

Learning Objectives

Arising from the Aims and Objectives Report, the following Objectives were approved by the Senate of the University in 1987. They are a set of objectives described in terms of the desired characteristics of educated graduates, and are used in part to guide educators in their development of courses and programs.

Literacy

Literacy is the base on which all else is predicated. The ability to read and write and, in general, to communicate properly is a fundamental intellectual tool. With it, students can learn to think clearly and to some purpose. Without it, they cannot analyze properly nor develop an independence of thought. Literacy affords a means of access to the raw material upon which the critical or creative intelligence is to be exercised. It affords a means of communication, of shaping ideas and concepts, of selecting between different or competing formulations. It is a means of instructing others.

The most basic experience in literacy given to the student should be the writing of a short expository paper, or the oral presentation of an informational report, on a prescribed topic or on a topic chosen from a restricted list.

At the next level, the student should be required to write a paper (or give a seminar), critical and analytical in its intent, on a topic of the student's devising. The ability to devise a topic, to frame its bounds, is at the same time an aspect of understanding of first order importance.

At the highest level, there should be produced a paper, in an appropriate style, that analyses, synthesizes or argues from a hypothesis and itself generates hypotheses; that produces knowledge, insight, or understanding in the reader and manifests it on the part of the writer; that shows a breadth of understanding in drawing out implications and making connections between remote features of the domain; that, in short, demonstrates a love of learning and an intelligent creativity. This requirement may readily be met in existing senior honours paper courses and the like.

Over the course of an undergraduate education, the level of difficulty of the material which the student can read, comprehend, and utilize should increase. One way of securing this might be to encourage, in each discipline program where they do not now exist, reading courses requiring independent work at the 400 level.

In general, the ability to read and comprehend materials of the highest difficulty is enhanced in semester long research paper courses and in reading courses. Such courses contribute also to independence of thought and to depth and breadth of understanding. In its broadest sense, the objective of literacy implies that it is desirable that the student have skill in another language, so as to be able to comprehend material of the appropriate level of sophistication in that language.

Numeracy

For the purposes of this discussion, numeracy may be defined as the ability to use mathematics at a level and in a manner appropriate to good citizenship and to vocational fitness. Mathematics deals with quantity and form, with measurement, structures, and relations, and encompasses a richer intellectual domain than just the utilitarian skills of numerical computation. It is as a mode of thinking, no less than as a collection of useful techniques, that it justifies its place in any well-rounded curriculum.

Numeracy, in the sense adopted here, is an essential attribute of the informed and responsible citizen. A correct understanding of the proper use of numbers is necessary in a culture in which information routinely comes in numeric form and significant decisions of social policy often have quantification at their base. Without the ability to comprehend the use of quantitative data, and to detect instances of misuse, we may have to forego opportunities for independent judgment.

Numeracy, more generally, enforces an accuracy and precision of procedure and thought that is valuable to all educated persons. As a mode of conceptualization of thought, it should be part of the mental apparatus of all graduating students. While a grasp of the nature and principles of mathematical forms of inquiry is essential to an understanding of scientific thought, it can be of benefit in other areas of intellectual activity. Opportunities for fostering numeracy exist in more disciplines than those traditionally requiring a substantial knowledge of mathematics. A recognition that numeracy, in association with literacy, forms the foundation of most if not all of the other learning objectives, should result in greater exploitation of those opportunities than in their avoidance.

Sense of Historical Development

All disciplines have a history, an understanding of which contributes to an understanding of the place each has in contemporary society. No discipline is self sufficient, and no discipline is autonomous. "Historical development" should not be narrowly construed to mean only the history of the discipline within its own limits, but efforts should be made to connect developments in the discipline to wider coeval social conditions. Students may thereby be endowed with a sense of the fundamental relativity of knowledge and understanding at any given time. This objective comports also a sense of the continuity of change (and, indeed, of discontinuities), over time. This objective may facilitate the acceptance, on the part of students, of intellectual ambiguity or uncertainty; such acceptance is a mark of depth of understanding.

Global Understanding

Global understanding may be associated with "Sense of Historical Development". It can be described as comprehension of the variety of political, religious, cultural, geographical, biological, environmental, and historical forces in the shaping of nature and the human condition. It conveys to the student an understanding of the ways in which specific cultural or geographical or other circumstances condition the differences between nations or peoples, and an understanding of the place of his or her discipline in the international setting. Global understanding may be enhanced by a sense of historical perspective, by breadth of understanding, and by independence of thought. In its turn it may itself contribute to these.

Moral Maturity

Moral Maturity is marked by depth and consistency of moral judgement; by recognition that any moral judgement may be fallible; that moral judgement is complex, in that moral principles, if they are to be applied to a specific case, may need to be interpreted. Moral maturity is a requirement in the person who is to apply a body of knowledge or a skill to the solution of a problem, or to the understanding of a situation, if the knowledge is not to remain abstract and the skill potential unrealized.

Attainment of this objective is probably best realized by appropriate consideration of moral issues in context, as they arise in the course of study. In this way, a moral perspective may be shown to be inherently important to study of a body of material, and not merely something supplementary to it (guidelines for conducting ethical discussion in the classroom have been written by the Ethics Research Group in the Department of Philosophy). Scope for demonstration of moral maturity can be provided in seminars and other assignments, if problems in the moral issues associated with a subject are set for consideration alongside problems in content and process.

Aesthetic Maturity

Aesthetic Maturity may be described as a quality of the critical response to some object, natural or artificial, external to the self. Or it may be a process of creation and development of the self. In the former case, aesthetic maturity may be attained by a sufficient exposure, not necessarily in courses alone, to works of art (inclusive of music, literature, and drama) and to the critical traditions concerning them. Such maturity may also be directed at aesthetic valuing of features of the natural environment.

In the latter case, attainment of the quality will require an active involvement in the work of creation itself. A different order of aesthetic maturity may be attained by practice of that form of manipulation and recreation of the original object known as criticism (as distinct from appreciation).

Viewed this way, aesthetic maturity has a certain resemblance to both independence of thought and depth of understanding, in requiring an active creativity. Aesthetic maturity need not be divorced from the specific character of individual disciplines. By possession and exercise of aesthetic maturity, students may be brought to appreciate the order, elegance, and harmony not only of the subject matter, but also of the procedures, of the discipline.

Understanding of Forms of Inquiry

Inquiry, the search for truth, information, knowledge and understanding, follows a methodology based upon systematic study, reflection, intuition and innate creativity. Inquiry involves resolving an identified problem, collecting relevant information, evaluating the information and observing relationships in order to reach a conclusion. The student is the active inquirer and must be able to undertake the process independently. Scientific method represents a form of inquiry concerned with hypotheses development, data collection, analyses and interpretation. Just as an understanding of scientific inquiry is necessary for the educated citizen functioning in the midst of the technologies of the contemporary world, so too an appreciation of other modes of inquiry is an essential characteristic of an educated citizen. Graduates should be familiar with the modes of inquiry utilized, for example, by historians, by philosophers and by scholars concerned with the various fields of creative expression.

As outcomes of this objective, students will understand the strengths and limitations of the various forms of inquiry, and the cultural, intellectual and historic impact of these forms. The student will be able to describe similarities and differences between the inquiry methods of the physical scientist, the biological scientist, the social scientist and the scholar of the humanities.

Depth and Breadth of Understanding

Breadth of understanding is an expression of the ability to operate across disciplinary boundaries in a coherent and productive way, with principles drawn from different disciplines. Depth of understanding depends upon mastery of a body of knowledge, but it is not to be confused with knowledge, and is not necessarily commensurate with the number of courses taken in a subject.

Depth and breadth of understanding depend upon, and themselves contribute to, independence of thought; they contribute also to a love of learning. Possession of a historical perspective may be essential to a broad and deep understanding of a subject.

At the lowest level of experience, in courses introductory to a subject, students might be shown how sets of facts may be related to others both laterally and vertically (or

hierarchically). The outcome of this might be simply consciousness, on the part of the student, of the possibilities of understanding, as distinct from simply knowing.

The next higher level moves from demonstration to the student, of interrelationships to the development of the student's own ability to create interrelations. The experience provided will develop a creative imaginativeness skillfully exercised on a body of material mastered in some detail. But the experience, like that provided for independence of thought, goes beyond display of erudition, and requires alert curiosity and a refusal to be content with mere assemblage of data. At this level, the student should be expected to integrate knowledge and modes of interpretation and comprehension from different disciplines, so as to generate a new understanding. The highest level takes the student to the ability to deal in abstractions, to generate abstractions.

In general, depth and breadth of understanding are characterized by the ability to recognize the implications of the information at hand and to put it into a broader context; and by the ability to draw upon different disciplines to provide a clearer and deeper understanding of the discipline with which the student is immediately concerned. These outcomes might be assessed in a piece of written work such as an independent research paper, in the design of an experiment, in the identification and solution of a problem, or in a work of aesthetic creation.

Independence of Thought

At the lowest level, students are shown the possibilities of independent thinking, by an instructor who, in the classroom and elsewhere, challenges orthodoxies and criticizes received opinions. The experience provided is that of imitation or emulation of a role model. At this level, the outcome might be no more than a receptivity, on the part of the student, to critical thinking and an openness to reasoned skepticism about the authority of the expert.

At a higher level, students become actively engaged in learning and thinking. At this level, they should be given the opportunity, in seminars, tutorials, or structured small group discussions, to offer their own challenges. The bases for such challenges may be unformed, and so the challenges themselves will be open to challenge. As students become more independent in thought, they are better able to combine ideas and to generate new ideas.

At the highest level, independence of thought is a manifestation of love of learning, and it may contribute to a sense of self worth and of well being. At this level, opportunities are provided for self directed learning. One accomplishment may be the ability to ask the right kinds of questions, rather than the ability always to have answers.

Love of Learning

Love of Learning is perhaps the quality that activates all other qualities that are the focus of learning objectives. Its expression is not easily separable from demonstration of other virtues. Thus, the true lover of learning will demonstrate both independence of thought and depth of understanding. As a consequence, setting an objective for love of learning comports also setting an objective for other qualities as well. But love of learning is not exhausted by (e.g.) independence of thought.

Love of learning may be reflected in, or expressed in terms of, intellectual curiosity; the ability (as in independence of thought) to ask useful kinds of questions (rather than the ability always to have answers); the ability to see far reaching implications; the ability to make connections between disparate topics; energy and passion in the pursuit of knowledge and understanding; dissatisfaction with simply accumulating facts or data; critical ability. Testing and instruction must minimize rote learning, and, so far as possible, give scope for the exercise of individual patterns of learning and individual interests.

Love of learning may be impeded by the demands of frequent evaluation of students' performance. The time frames imposed at an institutional level, to provide an organizational framework for the university experience, may also impair love of learning.

Love of learning may best be enhanced by the provision of opportunities for the student's personal involvement in learning. Such opportunities are perhaps best furnished in independent research projects initiated by the student. In such autonomous, but supervised, study the student can not only engage with the conflicting views of published authorities but also see in action, close at hand, the supervisor's own love of learning.

In courses of formal instruction, the use of team teaching might help to encourage a student's own love of learning, especially if members of the teaching team take an appropriate role as "students", and if true dialogue is developed between the teachers.

Policy on Responsibilities of Advisors, Advisory Committees and Graduate Students and Graduate Student-Advisor Mediation Procedures

This is the official policy of the University of Guelph approved in principle by the University Senate on January 15, 1991, and revised and reprinted annually thereafter. The request for a policy originated in the Board of Governors Committee on Student Rights and Responsibilities. The policy was developed by faculty/student committees of the Board of Graduate Studies in consultation with the departments and schools and with the university's solicitors. Mediation procedures for the resolution of disputes arising from disagreements in interpretation of the policy are included.

Preamble

Many individuals bring to graduate programs a rich and varied experience derived from universities throughout the world. This policy provides an outline of best practices and principles to guide the normal interactions within a graduate program at the University of Guelph. The University offers advanced degrees across a wide range of academic disciplines each of which has its own cultural variances with respect to how graduate research is conducted and how students are advised. Practices will vary as well depending on the nature of the student's research project and the stage the student is at in his/her program. Thus, the level of scrutiny and interaction may range from that occurring on a continuous basis to that in which the student operates quite independently with only occasional guidance. Regardless of the discipline, however, the underlying principle is one of mutual respect among students, faculty, and staff in an academic environment governed by traditional standards of research and professional integrity, without prejudice or discrimination. Within this context, the student, the Advisor, the Advisory Committee and the Department assume certain responsibilities or obligations and are entitled to expect reciprocal commitments. The policy is neither exhaustive nor exclusive and should be viewed in the context of normal circumstances.

This policy should be viewed as complementary to the University of Guelph statement on Student Rights and Responsibilities.

Responsibilities of the Advisor

A Faculty Advisor's primary task is to guide and inspire his or her students to reach their scholarly potential. The Advisor should promote conditions conducive to a student's research and intellectual growth, providing appropriate guidance on the progress of the research and the standards expected. Good supervisory practice includes the following:

1. Facilitating the student's intellectual growth and contribution to a field of knowledge.
2. Guiding the student, with the assistance of the Advisory Committee, in the development of a program of study.
3. Assisting in the development and execution of a research program or project.
4. Being reasonably accessible to the student via telephone, electronic communication or in person for consultation and discussion of the student's academic progress and research problems. What constitutes "reasonable accessibility" may vary according to discipline, stage of research, etc. However, an Advisor must be in contact with the student frequently enough to be able to make an informed judgement on the student's progress on a semesterly basis.
5. Thoroughly examining written material submitted by the student and making constructive suggestions for improvement. Informing the student of the approximate time it will take for submitted written material to be returned with comments. Normally, comments should be returned to the student within two weeks, although circumstances such as absences from campus or unusually heavy workload may require that the Advisor take longer than two weeks to review the student's work. Timing of submission and review should be negotiated between student and Advisor.
6. Advising the student as to the acceptability of the draft thesis or research project prior to submission to the Advisory Committee. If the Advisor believes the thesis or research project is not ready for submission or will not be ready within a particular time, the Advisor should so indicate with written reasons to the student. In cooperation with the Chair or Departmental Graduate Coordinator, helping to organize qualifying and final examinations.
7. Assisting the student in learning about all appropriate deadline dates and regulations associated with thesis review, examination and submission, as specified in the Graduate Calendar and/or by the Office of Graduate Program Services and/or the Department or School.
8. Giving ample notice of extended absences from campus such as research leaves, and making satisfactory arrangements for the advising of the student when the Advisor is on leave or on extended absence from the campus. Where a faculty member knows that he/she will be on leave for part of a student's program prior to the start of the program, the student should be informed of this at the outset. Depending on the length of absence and the stage of the student's program, it may be necessary to make arrangements for an interim Advisor.
9. Making reasonable arrangements, within the norms appropriate to the discipline and the limits of the material and human resources of the University, so that the research resources necessary for execution of the student's thesis or major paper research are available.
10. Advising the student of regulations designed to provide him/her with a safe environment. These include relevant safety and/or workplace regulations as well as policies designed to protect individual rights and freedoms. Alerting the student to any personal risks that may be encountered in the course of the research and providing training, guidance and adequate equipment appropriate for those risks.
11. Chairing the Advisory Committee. Responsibilities will include:
 - holding regular Advisory Committee meetings with the student, normally no less than once per semester
 - submitting evaluation reports every semester, in consultation with the Advisory Committee, to the Departmental Graduate Studies Committee

- formulating a plan of action with the student and the Advisory Committee to address any problems that have been identified as a result of a semester progress review, and
- when a semester progress rating of "Some Concerns" or "Unsatisfactory Progress" has been assigned, providing written notification, including the signatures of all Advisory Committee members, to the Faculty of Graduate Studies.

Note

A "satisfactory" evaluation represents normal progress on course work and research. A "some concerns" report is compatible with an expectation for successful completion of the program, but indicates some specific concerns regarding the student's current performance and/or progress on course work or research or both. An "unsatisfactory" report is a clear indication of concern about the student's ability to complete the program. Such concern may be based on poor performance in course work or research or both. Unsatisfactory progress could include failure to meet agreed research milestones, including the timely preparation of a research proposal, including the signatures of all Advisory Committee members, to the Faculty of Graduate Studies.

12. Complying with any commitment of financial support made to the student as part of the offer of admission. In the event that expected financial support becomes unavailable, the Advisor will work with the Department and Faculty of Graduate Studies to ensure support for the student.
13. Acknowledging, in accordance with University policies, the contributions of the student in presentations and in published material, for instance through joint authorship.
14. Immediately disclosing to the Department Chair any conflict of interest that arises with the student. Conflicts of interest will arise when there are sexual, romantic, or familial ties between the Advisor and student or when there are irreconcilable interpersonal conflicts, and in such cases it is expected that the faculty member will withdraw from the role of Advisor. Conflicts of interest may also arise when the Advisor or student have a financial interest in the outcome of a research project. In these cases, the decision as to whether withdrawal is appropriate should be made in consultation with the Department Chair.

Responsibilities of Advisory Committees

Members of an Advisory Committee can do much to enhance the academic experience for a student, allowing the student to take advantage of a range of expertise in the discipline. The specific responsibilities of an effective Advisory Committee are as follows:

1. Encourage the student's intellectual growth to become a competent contributor to a field of knowledge. In this context, the Advisory Committee must provide constructive criticism and provocative discussion of the student's ideas as the program develops. The Committee should ensure that the student is exposed to a wider range of expertise and ideas than can be provided by the Advisor alone, including directing the student as appropriate to consult with experts outside the Committee.
2. Be reasonably accessible to the student for consultation and discussion of the student's academic progress and research problems.
3. Attend regular meetings of the Advisory Committee with the student, normally no less than once per semester.
4. Develop, with the student's involvement, and formally approve a list of courses that would constitute the program of study, no later than the end of the second semester. (This program of study is not considered final until also approved by the Department and the Faculty of Graduate Studies. Such approval will not normally be withheld if the proposed program meets the published program requirements.)
5. In consultation with the Advisor, confirm and approve progress reports in those cases where there are concerns or when the progress being made is unsatisfactory. ("Some Concerns" and "Unsatisfactory" progress reports will also be forwarded to the Department and the Faculty of Graduate Studies.)
6. Formulate a plan of action with the student to address any problems that have been identified as a result of a semester progress review of "Some Concerns" or "Unsatisfactory".
7. Inform the student of the approximate time it will take for submitted written material to be returned with comments. If the expected time exceeds the normal two-week turnaround, for instance because of absence from campus or an unusually heavy workload, provide the student and the Advisor with an estimate of the time required.
8. Thoroughly review and comment on drafts of written material. Inform the student as to whether or not a research project is complete or a thesis ready for submission to the final examination committee. If additional work is required, provide feedback to guide the student in satisfactory completion of the work.
9. Immediately disclose to the Advisor and the Department Chair any conflict of interest that arises with the student. Conflicts of interest will arise when there are sexual, romantic, or familial ties between the Advisory Committee member and the student or when there are irreconcilable interpersonal conflicts, and in such cases it is expected that the faculty member will withdraw from the Advisory Committee. Conflicts of interest may also arise when the Advisory Committee member or student have a financial interest in the outcome of the research project. In these cases, the decision

as to whether withdrawal is appropriate should be made in consultation with the Department Chair and the Advisor.

Departmental Responsibilities

The development and maintenance of a high-quality graduate program is of key importance to every department in the Faculty of Graduate Studies. It is, therefore, in each Department's best interest to encourage and support effective graduate advising.

The responsibilities of the Department may be assigned by the Chair in whole or in part to the Graduate Coordinator and shared by the Graduate Studies Committee. If such a designation of responsibilities occurs, that division of responsibilities should be clearly outlined and publicly available. In the case where the Graduate Co-ordinator is the faculty advisor, the responsibilities of the Graduate Co-ordinator with respect to departmental advising duties will be carried out by the Chair or his/her designate. Where the Chair, is the faculty advisor, his/her Departmental Responsibilities with respect to advising will be carried out by the Graduate Co-ordinator or his/her designate. The Department should:

1. Assist the Advisor and student in determining appropriate deadline dates and regulations associated with review, examination and submission of the thesis or research project as specified in the Graduate Calendar and/or Graduate Program Services and the Department or School.
2. Make available to faculty and students information about current courses, areas of expertise of faculty members, and pertinent information not already outlined in the Graduate Calendar. This information may be available through the Department website, graduate handbook or occasional flyers.
3. Set up procedures that match students and advisors, with the matching to be completed as quickly as possible, not later than within six months of initial registration.
4. Approve the advisory committee/graduate degree program form no later than the end of the student's second registered semester.
5. Establish procedures by which the Graduate Coordinator and, if appropriate, the Graduate Studies Committee can monitor progress of graduate students through reports by the Advisor, student, and appropriate others, and to communicate this progress to all involved parties.
6. Investigate situations where an Advisory Committee has not met for two or more consecutive semesters. In addition, investigate perceived irregularities in student/Advisor/Advisory Committee relationships.
7. If a student has received an unsatisfactory evaluation report for two consecutive semesters then the Departmental Graduate Coordinator will meet with the student, the Advisor and the Advisory Committee to consider the lack of progress and any possible remedial measures.
8. Maintain a list of scheduled faculty leaves and, where warranted, assist in making satisfactory arrangements for the advising of the student when the Advisor is on leave or on extended absence from the campus. Depending on the length of absence, it may be necessary to make arrangements for an interim Advisor.
9. Encourage the interaction of graduate students with other students and faculty, and the development of a professional identity through research seminars, posting of conferences, and other means.
10. Inform Graduate Program Services should there be unresolved concerns about either the Advisor's effectiveness or the student's performance.
11. Allow students to change Advisors if their research interests shift or develop in a new direction and if the change reasonably can be accommodated by the Department.
12. In the event that an Advisor or Advisory Committee member withdraws because of a conflict of interest, work with all parties to mitigate any negative consequences of the withdrawal.

Graduate Student Responsibilities

From the choice of Advisor, choice of research project and through to degree completion, graduate students must recognize that they carry the primary responsibility for their success. The responsibilities assigned to Advisors, Advisory Committees and Departments provide the framework within which students can achieve success. Students should take full advantage of the knowledge and advice that the Advisor and Advisory Committee have to offer and make the effort to keep the lines of communication open. Specifically, each graduate student has a responsibility to:

1. Make a commitment to grow intellectually, in part by fulfilling course requirements as outlined by the Advisory Committee, and to contribute to a field of knowledge by developing and carrying out a program of research.
2. Learn about all appropriate deadline dates and regulations associated with registration, award applications and graduation requirements, as specified in the Graduate Calendar and/or the Office of Graduate Program Services and/or the Department or School.
3. Recognize that thesis and research project topics must be within the scope of the appraised and approved graduate program as set out in the program descriptions in the Graduate Calendar.
4. Choose, with the approval of the Advisor and Advisory Committee, a topic of research for which adequate resources are available, including financial and physical resources and faculty expertise.

5. Choose, with the approval of the Advisor and Advisory Committee, a topic of research for which adequate resources are available, including financial and physical resources and faculty expertise.
6. Conform to University, Faculty and Program requirements, academic standards, and guidelines including those related to deadlines, thesis or research project style, course requirements, intellectual property, academic misconduct and any relevant safety and/or workplace regulations.
7. Produce a thesis or research project which is the student's own work and which meets the University and Department standards for style and quality, reflecting a capacity for independent scholarship in the discipline.
8. Consider and respond to advice and criticisms provided by the Advisor or members of the Advisory Committee.
9. Meet or communicate regularly with the Advisor (or designate). The frequency and timing of meetings will depend on the nature of the research being undertaken and the stage in the student's program. However, meetings should be of sufficient frequency that the Advisor can make an adequate assessment of the student's progress each semester and the student receives timely feedback on what is being done well and where improvement is needed. The student should also interact with individual Advisory Committee members and other faculty as appropriate and meet with the Advisory Committee, normally no less than once per semester, to review progress.
10. On a regular basis, make available to the Advisor all original research materials, retaining a copy where appropriate.
11. Be prepared to approach first the Advisor and then the Graduate Coordinator or Chair with any perceived problems or changes in circumstances that could affect performance. (If circumstances warrant, students may wish to consider a leave of absence on compassionate grounds. Information about this may be obtained from Graduate Program Services or from the departmental Graduate Co-ordinator.)
12. Submit, with specific reasons, any request for the replacement of an Advisor or member of the Advisory or Examining Committee to the Departmental Graduate Coordinator should a personal or professional conflict arise. Students should take immediate steps to change their Advisor or a member of their Advisory Committee in cases where an appropriate academic relationship cannot be maintained. In most circumstances, the first step would be to meet with the Graduate Coordinator.
13. Recognize that changing Advisors after program entry may have consequences in terms of the nature and focus of an appropriate research topic, and may alter funding planned prior to the change from the initial Advisor as outlined in the Department's letter of funding.
14. Recognize that the student may be obliged to satisfy specific performance requirements that were agreed to at the time of acceptance to the graduate program. These performance requirements may relate to internal or external funding support that the student receives.
15. Recognize that progress will be evaluated every semester by the Advisor and Advisory Committee, and reported to the Program and in the case of "some concerns" or "unsatisfactory" performance, to the Faculty of Graduate Studies.

Dispute Resolution Mechanisms (with flowchart)

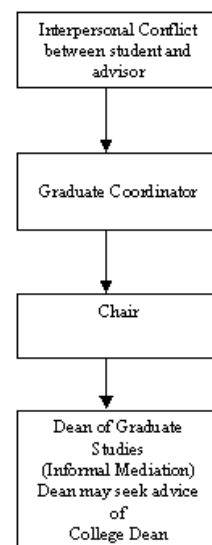
Regardless of the best intentions of all involved, conflict can arise in the course of graduate studies. Depending on the type of conflict and the issues involved, different resolution mechanisms will be appropriate. Four types of conflict can arise in the course of graduate studies. These are:

1. Interpersonal conflict between the student and the advisor.
2. Dispute about evaluation of progress, qualifying or oral examination; includes procedural irregularity.
3. Disruptive, abusive, or destructive behaviour on the part of the advisor.
4. Disruptive, abusive, or destructive behaviour on the part of the student.

Following is a brief summary of the various conflict resolution processes currently in place at the University and based upon current policies. Complainants, responding administrators or committees who believe they have or are dealing with a human rights complaint may, at any time, consult the University's Human Rights Policy and the Human Rights and Equity Office. The attached flow chart provides a visual representation of the various processes.

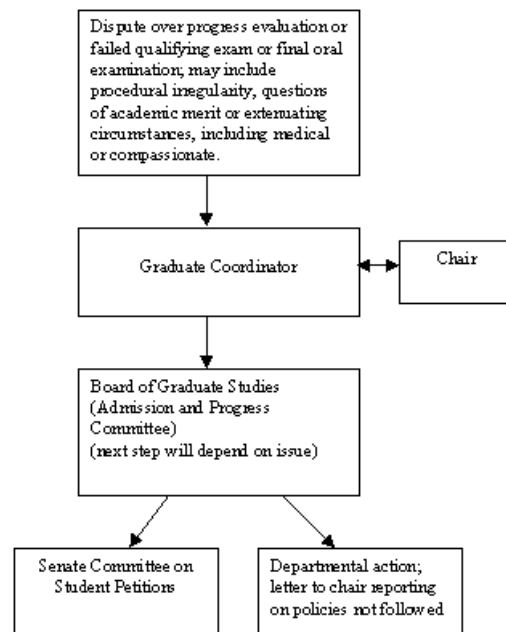
Interpersonal conflict between the student and the advisor

As in any other domain of human endeavour, conflict can arise between the student and Advisor simply because of differences in personality, communication style, or unspoken expectations. In many cases, such conflict can be resolved through improved communication, but occasionally the situation deteriorates to the point where external mediation is required. The proposed dispute resolution mechanism is consistent with other University policies, emphasizing action first at the local level. The initial complaint should be brought to the attention of the Graduate Coordinator, but if that individual is unable to resolve the dispute the Chair should become involved. If the Chair cannot resolve the matter, the Chair should inform the Dean of Graduate Studies who, in consultation with the College Dean, will provide informal mediation.



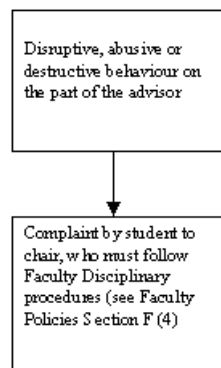
Dispute about evaluation of progress, qualifying or oral examination; includes procedural irregularity

Disputes may arise regarding the quality of a student's work or the procedures used to assess this work. For example, there may be disagreement about the outcome of a failed qualifying examination or final oral examination. There may also be disagreement over the methods of assessing academic work or evaluating progress, including the means used to accommodate a student's disability or special circumstances. These disputes should first be brought to the attention of the Graduate Coordinator who may also consult the Chair. If the matter cannot be resolved at the departmental level, and/or the Department is unsure about options for resolution, the case should be referred to the Admissions and Progress Committee of the Board of Graduate Studies. The Committee will issue a ruling on the case to the Department, and may require specified action. Such action may include a requirement to seek independent evaluation by one or more internal or external assessors of the student's work. If the Admission and Progress Committee upholds the Departmental decision, and the student wishes to make the case that the methods and criteria used by the Department did not conform to procedures established by Senate, the student may appeal the decision to the Senate Committee on Student Petitions within 90 days.



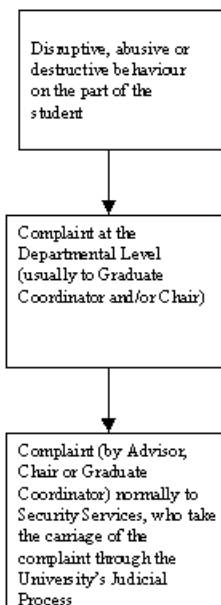
Disruptive, abusive or destructive behaviour on the part of the advisor

Disruptive, abusive, and destructive behaviour on the part of the Advisor is unacceptable in a scholarly environment. Faculty Policies, Section F(4), expressly prohibits "gross misconduct, toward another member of the University Community in the context of University activity", and "intimidating, harassing, or abusive behaviour of a serious nature". Section F(4) also contains detailed instructions on the investigation and remediation of such cases, which bind both complainants and departmental authorities.



Disruptive, abusive, or destructive behaviour on the part of the student

Disruptive, abusive, and destructive behaviour on the part of the student is also unacceptable in a scholarly environment. The University's Student Rights and Responsibilities Policy, which is stated in the Graduate Calendar, lists a number of offences against individuals and property. Advisors, fellow students, or other faculty may register an informal complaint about a student's behaviour with the Graduate Coordinator or Chair, who will attempt to resolve the matter. The Graduate Co-ordinator/Chair may also choose to involve the Dean of Graduate Studies in attempting to reach a resolution. If the Graduate Coordinator, in consultation with the Chair and/or Dean, is unable to resolve the matter, a formal complaint should be made, normally to Security Services, who take carriage of the complaint through the University's Judicial Process.



Student Rights and Responsibilities

Student membership at the University of Guelph is associated with fundamental rights and responsibilities intended to maintain the integrity of the University as a community for learning. Staff, faculty and students co-operate to sustain an educational environment that promotes individual learning and development. The University is responsible for providing the resources and opportunities that the students require to succeed.

The University accepts that you are able to make responsible decisions regarding your own moral and social behaviour. The purpose of these regulations is to provide for an environment that supports personal and intellectual growth. These regulations are intended to recognize your rights as a student and the rights of others, while also identifying certain responsibilities of students that are a part of the exercise of these rights.

The Student Rights and Responsibilities brochure outlines the basis of conduct considered to be consistent with the goals and wellbeing of the University community and describes the process in place to review reported incidents of misconduct. The code of conduct was developed collaboratively by students, staff and faculty and is regularly reviewed by the entire University community.

For purposes of Student Rights and Responsibilities, a student is any person registered in an undergraduate or graduate program proceeding toward a degree, a diploma or a certificate at the University of Guelph, or otherwise taking credit or non-credit courses offered by the University, or any person who was a student at the time the alleged offense occurred. Allegations involving non-academic offenses for students registered in University of Guelph-Humber programs are handled under the procedures for Humber College.

As a student you have the RIGHT to access the Judicial system if a violation of this policy has occurred, whether that violation has occurred on or off campus, provided that the violation affects your ability to use and enjoy university facilities.

The term "University of Guelph community", as referenced in this document, includes the Regional Colleges at Alfred, Kemptville and Ridgeway.

University Community Principles

The University of Guelph is dedicated to the advancement of learning and the dissemination of knowledge; the intellectual, social, moral and physical development of its members; and the betterment of society (University of Guelph Act, 1964). These overall goals commit us to three central values:

- The development of all members of this university community, which implies and affirms the dignity, worth and autonomy of the individual.
- A focus on learning and knowledge, which upholds the fundamental importance of reasoned debate and inquiry in all of this university's academic and service functions.
- Societal enhancement, which extends the commitment to individual development beyond the walls of the institution to the ideal of service to the broader community.

Student Regulations

Academic Responsibility¹

You have the right to engage in free intellectual enquiry and, within the limits of the materials and human resources and approved University protocols, to access the resources necessary to plan and accomplish your educational and career objectives. You have the responsibility to:

- pursue the Learning Objectives established by the University in the context of your own program and goals;
- adhere to the schedule of dates and academic and non-academic regulations;
- consult your academic advisor (Program Counsellor, Departmental Advisor, Graduate Coordinator) or the relevant Academic Review Committee if extenuating circumstances affect your academic performance;
- abide by the University's Policy on Academic Misconduct.¹

Note

¹ Refer to the Associate Diploma Calendar; Undergraduate and Graduate Calendars.

Offenses

Civil/Criminal Statutes

You retain your rights as a citizen when you become a member of the University community. You have the responsibility to abide by Federal, Provincial and Municipal statutes in addition to the University's own regulations; including but not limited to the Acceptable Use Policy and Guidelines for University of Guelph Computing and Networking Facilities² and the In-Line Skates, Roller Blades and Skateboards Policy³. The University's interest may cause it to initiate a hearing (refer to Judicial Processes) whether or not non-university authorities have taken action.

Note

² Refer to the University's Acceptable Use Policy and Guidelines on Computing

³ Refer to the University's In-Line Skates, Roller Blades and Skateboards Policy (also available at the Director's Office at each Regional College).

Offenses against Persons

Bodily Harm

You have the right to an environment that is safe and free from unwanted attention. You have the responsibility not to engage in activities likely to endanger the health or safety of yourself or another person, or to assault or threaten to assault another person, or to knowingly cause another person to fear bodily harm.

Harassment

You have the right to an environment characterized by mutual respect. You have the responsibility to treat all members of the University community with respect and without harassment. Harassment is defined as any attention or conduct (oral, written, graphic or physical) by an individual or group who knows, or ought reasonably to know, that such attention or conduct is unwelcome/unwanted, offensive, or intimidating.

Offenses involving Property

Facilities, Telecommunications, Library, Property and Private Property

You have the right to the use of University facilities. You have the responsibility to:

- respect posted hours and limits on entry where such conditions exist;
- confine smoking only to areas designed for that purpose;
- not destroy, tamper with, deface or vandalize, monopolize, unlawfully access, remove or possess property not your own, including, but not limited to, Library material, computing facilities, telecommunication systems, and emergency telephones;

- not discharge, tamper with or operate any fire prevention or detection equipment for any purpose other than the control of fire. (For students found guilty of offences under this section, mandatory minimum penalties apply.)

Permits and Identification

You have the right, upon payment of any required fee, to access certain special services as a University community member. You have a responsibility not to acquire or use meal cards, University identification, computer identification, bus passes or parking permits that are stolen, cancelled, lost, false, altered or expired.

Grounds

You have the right to use of the University grounds. You have the responsibility to observe the following specific limitations:

- **Authorized Entry**-- posted hours and limits on entry must be observed and adhered to.
- **Bicycles** -- Bicycles are subject to removal at the owner's expense if they are secured to trees or railings, secured to ramps for the disabled, left in fire routes or stairwells of any University building or otherwise found obstructing by being in any unauthorized area.
- **Automobiles** -- Automobiles are subject to removal at the owner's expense if left in fire routes, area for disabled access, pedestrian walkways, driveways, or otherwise found obstructing by being in an unauthorized area.
- **Temporary Accommodation** -- Sleeping or maintaining residence in vehicles, trailers, tents or University facilities is prohibited, except where specifically authorized.
- **Pets** - Pets on campus must be under direct control at all times and must not be left unattended. Pets are not allowed in University buildings except as authorized.

Disruption

You have the right to an environment that, while safeguarding dissent, is free from interference and disruption. You have the responsibility not to intimidate, interfere with the normal functioning of the University, nor to intimidate, interfere with, threaten or otherwise obstruct any activity organized by the University, including classes, or to hinder other members of the University community from being able to carry out their legitimate activities, including their ability to speak or associate with others.

Other

Drugs and Alcohol

You have the responsibility to abide by the Provincial Liquor Licence Act and Provincial and Federal statutes pertaining to illegal drugs and alcohol. The possession, use or trafficking of illegal drugs is prohibited, and each activity may form the basis of a separate charge. The possession of liquor by those under the age of 19, is prohibited. Consumption or open possession of liquor is prohibited, other than in those residence rooms where it has been specifically permitted or in licensed premises.

Visitors

You have the right, upon compliance with existing sign-in requirements (Student Housing Services and licensed establishments), to have visitors on campus. As their sponsor, you have the responsibility to ensure that your guests abide by these regulations.

Firearms and other Weapons

Firearms, any other weapons, firecrackers, gunpowder, or any other forms of unauthorized explosive or volatile materials are prohibited on campus.

Judicial Processes

Every student has a right to a full and fair hearing, by an impartial tribunal, of the merits of any charge brought against him or her under these regulations. Every student who is charged with a non-academic offence has a right to present a full and complete defence, and to be accompanied by an advisor (or legal counsel) at any hearing of the charge against him/her. Students charged are presumed innocent until found guilty on the basis of evidence presented, using the balance of probabilities as the standard of proof. The University has devised a process which provides for appropriate disciplinary penalties to be imposed. These penalties may include fines (up to \$1000), probationary periods, warnings and, in extreme cases, a recommendation for suspension or expulsion.

Every student has a responsibility to comply with a Summons or Decision and Order of the Judicial Committee and/or Hearing Board. Failure to do so may constitute a breach of Student Rights and Responsibilities.

The President or designate may implement an interim suspension if, in his/her opinion, a student's conduct raises a reasonable apprehension of harm to the student or to others in the University community, or the normal functioning of the University. A Judicial proceeding will be undertaken as soon as possible to allow for a hearing of the case and, in any event, no longer than fourteen (14) working days from the laying of the charge.

The Judicial Committee at the main campus and each Regional College has the authority to enforce these regulations if a breach of the regulations occurs off-campus which affects the rights of the members of the University community to use and enjoy University facilities.

Each Judicial Committee is an appointed tribunal of students, staff and faculty that hears reported incidents of student behaviour that represent alleged infractions of the student regulations and formal complaints against students under the policy Human Rights at the University of Guelph. The Judicial Committee may also act as an appeal body to hear

appeals regarding decisions of a non-academic nature imposed by a University of Guelph department or Regional College where there is no other existing appeal process.

Decisions of a Judicial Committee may be appealed to the Hearing Board, or in the case of the Regional Colleges, the Appeal Board. The Hearing/Appeal Board is a student/faculty tribunal appointed from a roster of candidates, based on recommendations from the Colleges. The Board hears appeals from decisions of the Judicial Committee when one or more of the grounds for appeal are satisfied.

Further information on the Judicial process may be obtained from the Judicial Officer, Senate Secretariat, 4th floor, University Centre, at ext. 53116, or from the Director's Office at each Regional College.

Further information and additional copies of the Student Rights and Responsibilities document are available through this link, from the Office of Student Affairs, 4th floor, University Centre, at ext. 43868, or from the Director's Office at each Regional College.

Comments on the document and specific suggestions for amendments or additions to the student regulations are welcome at any time and should be referred to the office of student affairs.

Note

Refer to the Human Rights at the University of Guelph document.

IV. Degree Regulations

The academic requirements of the master of arts (MA), master of applied nutrition (MAN), master of business administration (MBA), master of engineering (MEng), master of fine arts (MFA), master of landscape architecture (MLA), master of science (MSc), master of science in aquaculture (MSc [Aqua]), master of science in planning (MSc[Planning]), doctor of philosophy (PhD), doctor of veterinary science (DVSc), and graduate diplomas (GDIP).

Doctor of Philosophy

Admission

There are three means of entry to PhD study:

- An applicant who holds a recognized master's degree obtained with high academic standing may be admitted to PhD studies as a regular or provisional student.
- An applicant who has achieved excellent standing at the honours baccalaureate level and who wishes to proceed to doctoral study may enrol, in the first instance, in a master's degree program. 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, may authorize transfer to the PhD program without requiring the student to complete the master's degree. The application for transfer must be made between the end of the second semester and the end of the fourth semester.
- At the applicant's request, some departments may choose to recommend to the Board of Graduate Studies direct admission to the PhD program after completion of an honours baccalaureate with high (first-class) standing and demonstration of research promise. Information on direct admission and procedures to be followed is available from Graduate Program Services.

Minimum Duration

At least five semesters of full-time study must be devoted to the doctoral program following completion of a recognized master's degree. At least seven semesters are required for those who are permitted to proceed from the honours baccalaureate without completing the master's degree. For a student registered part-time, the minimum duration period is based on the equivalence of three part-time semesters to one full-time semester.

Completion

Normally, the thesis must be formally submitted (see Submission of Thesis) within forty-eight months of the completion of the minimum duration. Candidates must understand, however, that announced departmental policy may require completion of the degree requirements within a briefer time period.

Advising

The advisory committee will consist of no fewer than three members of the graduate faculty in the selection of whom the graduate student normally participates. At least one of the committee members must be in a department other than that in which the student is registered. The committee chair is normally the advisor of the student's research, and is nominated by the department chair.

Courses

The PhD degree is primarily a research degree; for that reason course work commonly comprises a smaller proportion of the student's total program than is the case at the master's level.

Prescribed Courses: Some departments may designate that certain courses be taken as part of the student's background in his or her discipline. Other courses may be designated because of the close relationship to the research topic. It is such substantive courses that should comprise the prescribed courses in which the candidate must obtain an overall weighted average of at least 'B-' standing (see Establishment of Program and Prescribed Studies).

Additional Courses: In addition to the prescribed courses, it is not unusual for the student to complete ancillary courses supportive of the discipline and special field. The language requirement of some departments may be for some students most readily met by completing one or more courses in the language concerned (see entry for Departments of French Studies and Languages). They would not be regarded as prescribed.

Research

In the total program of a doctoral student, it is expected that the major part of the student's time will be devoted to research for their thesis. The research proposal should be formulated at as early a date as possible and presented to the advisory committee for approval. When it is necessary for the research, or some part of it, to be conducted off-campus, the arrangements are subject to the prior approval of the dean of Graduate Studies.

Qualifying Examination

As early as possible and in no case later than the final semester of the minimum duration requirement, the student is required to pass an examination to assess his or her knowledge of the subject area and related fields. The examination ordinarily will be in several parts (written and/or oral) and should be completed within a two-week period if possible.

The qualifying examination is an examination by the academic unit in which the student is enrolled (as distinct from an examination by the advisory committee). Upon completing it satisfactorily, the student is deemed to have met the departmental standards and becomes a candidate for the PhD degree. The examining committee, appointed by the chair or director of the academic unit concerned, consists of five members:

- The chair/director of the academic unit (or designate) or the chair of the graduate studies committee, who acts as chair of the examination committee *except* when this person is also chair of the advisory committee. In that event, the chair will designate another member of the graduate faculty of the unit to chair the examination;
- Two members of the graduate faculty who are not members of the advisory committee, in addition to the chair;
- Two members of the advisory committee;
- Normally, at least one of the qualifying examination committee members must be from outside the department in which the student is registered. That person may be a member of the advisory committee.

As a qualifying examination, consideration is to be given not only (1) to the student's knowledge of the subject matter and ability to integrate the material derived from his or her studies, but also (2) to the student's ability and promise in research. The examining committee, therefore, will receive from the advisory committee a written evaluation of the quality of the student's research performance to date and of the student's potential as a researcher. The examining committee will determine the relative importance to be given to these two major components of the qualifying examination.

The student is deemed to have passed the qualifying examination if not more than one of the examiners votes negatively. An abstention is regarded as a negative vote. The results of the qualifying examination will be reported to the dean of Graduate Studies through the chair of the academic unit. The report to the dean will record the decision as unsatisfactory or satisfactory. If unsatisfactory, the student may be given a second attempt at the examination. A student who fails the qualifying examination and who is being given a second opportunity to pass the examination will be required to repeat it no later than six months after the failed attempt. Academic units may impose a shorter time limit. A second failure constitutes a recommendation to the Board of Graduate Studies that the student be required to withdraw (see Unsatisfactory Progress and Appeals of Decisions).

Thesis

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.

External Examiner

For each doctoral thesis an external examiner from outside the university is appointed on behalf of the dean of Graduate Studies by the department chair, in consultation with the advisor. The nomination will be made when the candidate's advisor declares that the thesis is about to be prepared, normally no later than the beginning of the student's last semester. The external examiner will submit a written appraisal of the thesis (at least seven days prior to the examination) to the chair of the department who will then provide these comments to the candidate and the Advisory Committee. The external examiner is expected to participate in the final oral examination and to assist in evaluating all aspects of the candidate's performance.

Procedures

The thesis may be submitted at any time of the year, but candidates are advised to allow ample time for revision and examination. A copy of the schedule of deadlines should be obtained from Graduate Program Services by the candidate no later than the beginning of the semester in which the candidate intends to graduate.

It is understood that, as the thesis is being written, the candidate will be in regular communication with the advisory committee. When a draft is completed which the advisory committee recommends for examination, the candidate, with the endorsement of the departmental chair, formally requests an examination. A copy of the final draft is then sent to the external examiner as fair copy of the thesis. Arrangements for the final oral examinations are made. It is understood that as a result of the final oral examination corrections may be necessary to produce a revised final draft of the thesis.

Final Oral Examination

The final oral examination is devoted chiefly, but not necessarily entirely, to the defence of the doctoral thesis. It is a faculty (as distinct from a departmental) examination, for which the arrangements are made by the department on behalf of the faculty in consultation with Graduate Program Services.

The examination is conducted by a committee consisting of five members:

- A member of the graduate faculty who is not a member of the advisory committee appointed to act as chair by the department chair on behalf of the dean;
- The external examiner;
- A member of the graduate faculty, who is not a member of the advisory committee, selected by the departmental graduate studies committee;

- Two members of the student's advisory committee, selected by the advisory committee.

The dean of Graduate Studies, or a designate, may attend a part or all of the examination. The examination is open to the public but members of the audience may question the candidate only upon invitation of the chair of the committee.

The members of the examination committee, including the external examiner, report individually on the final examination and the thesis. The candidate is deemed to have passed if no more than one of the five examiners votes negatively. An abstention is regarded as a negative vote. Concurrently, the members sign the Certificate of Approval, which is submitted with the approved thesis in its final form to Graduate Program Services (see Submission of Thesis). The report to the dean of Graduate Studies will record the decision as unsatisfactory or satisfactory. If unsatisfactory, the candidate may be given a second attempt. A second unsatisfactory result constitutes a recommendation to the Board of Graduate Studies that the student be required to withdraw (see Unsatisfactory Progress and Appeals of Decisions).

Copies of Thesis

Two unbound copies of the certified thesis must be submitted to Graduate Program Services by the deadline date shown in the Academic Schedule in the calendar. Both copies must include the Certificate of Approval signed by the external examiner and the members of the examination committee. Also included must be a copy of an abstract consisting of no more than 350 words and a copy of the circulation waiver and the copying licence.

Publication

The Certificate of Approval indicates that the thesis is suitable for publication. The university requires publication of the thesis in the following manner:

One unbound copy of the thesis is forwarded to the National Library of Canada, together with an agreement form signed by the candidate authorizing the National Library to microfilm the thesis and to make copies available for sale on request. The National Library will film the thesis exactly as it is and will list the thesis in Canadiana as a publication of the National Library.

The National Library's Microfilm Publication Agreement will be sent to the candidate prior to the final oral examination, to be signed and submitted to Graduate Program Services immediately after the successful completion of the examination.

An abstract of not more than 350 words, prepared by the author and approved by the advisor, is forwarded by the National Library to the publishers of American Doctoral Dissertations. The abstract is printed in this work and the availability of the thesis in microfilm at the National Library is announced.

The candidate, in consultation with the advisor and the department chair, shall have the right to request that circulation and/or copying of the thesis in any form be withheld for up to one year.

Publication in the above manner does not preclude publication of all or part of the thesis in journals or in book form.

Departmental Regulations

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

Doctor of Veterinary Science

Admission

- The normal basis for admission to DVSc studies as a regular or a provisional student is a DVM or equivalent degree which 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. If a student enrolled in the graduate diploma program achieves a superior record and shows a particular aptitude for applied studies, the Board of Graduate Studies, on recommendation of the Interdepartmental DVSc Program Committee may authorize transfer to the DVSc program effective in the following semester. The recommendation must be made no later than the end of the second semester.
- An alternative basis for admission is a DVM or equivalent degree plus either an acceptable graduate diploma or an acceptable MSc degree or PhD degree, with upper 'B' level average standing. Students so admitted may be granted credit for two semesters in the DVSc program.

Minimum Duration

At least nine semesters of full-time study must be devoted to the doctoral program. Credit may be allowed for up to two semesters of previous graduate study as indicated above. For a student registered part-time, the minimum duration period is based on the equivalence of three part-time semesters to one full-time semester.

Completion

Normally, all requirements for the degree must be completed within twenty-four months of completion of the minimum duration.

Advising

Advisory Committee

This committee will consist of no fewer than three members of the graduate faculty. The graduate student normally participates in their selection. At least one of the committee members must be in a department outside the one in which the student is registered. The committee chair is normally the advisor of the student's program and is nominated by the department chair.

Interdepartmental DVSc Program Committee

This program committee, appointed by the Board of Graduate Studies, will consist of one member of the graduate faculty in each of the departments involved, and will be chaired by the dean of the Ontario Veterinary College or a designate. The program committee will review and make recommendations to the dean of Graduate Studies upon all applications for admission; it will review the proposed program of study and the semester evaluation reports of each student (see Department Review); and it will determine the membership of each qualifying examination committee. The program committee may specify regulations in addition to those set out here, and will be responsible for publicizing them in each department, where the student is responsible for seeking out this information.

Courses

The DVSc degree is an advanced applied degree which requires the acquisition of applied skills and in-service training, and the submission of a thesis based on research investigations in an applied area. Depending upon the background of the individual student, the proportion of time devoted to investigational work normally will be no less than one-third of the total.

Prescribed Studies

The program committee may designate certain courses to be taken as part of the student's background in the disciplinary area of specialization. Other courses may be designated because of the relationship to in-service training and applied skills. Such substantive courses comprise the prescribed courses in which the candidate must achieve an overall weighted average of at least 'B-' standing (see Establishment of Program and Prescribed Studies). At least 2.5 credits of prescribed courses must be completed, of which no more than 1.0 credits may be in Special Topics courses. Students who are granted credit for previous graduate study may, with the approval of the DVSc Program Committee and the dean of Graduate Studies, have the credits from prescribed courses reduced to no fewer than 2.0.

Additional Courses

In addition to the prescribed courses, the student may complete ancillary courses supportive of the discipline and specialty fields.

Program of Study

The program of study will involve course work and research work on a problem with applied aspects. The total program, including the research proposal, should be formulated as early as possible, but in no case later than the end of the second semester. Prepared in consultation with the advisory committee, the program is subject to the approval of the program committee and, ultimately, the dean of Graduate Studies. If it is necessary for any part of the program to be conducted off-campus, the arrangements are subject to the prior approval of the program committee and the dean of Graduate Studies.

Each semester, the student's advisory committee prepares a written evaluation of the student's performance in course work and of progress in applied skills. The evaluation will be discussed with the student before being sent to the program committee. If the student fails to make satisfactory progress, the program committee may recommend to the Board of Graduate Studies that the student be required to withdraw (see Cancellation of Registration).

Qualifying Examination

Prior to the end of the sixth semester, the student is required to pass a qualifying examination to assess his or her overall ability in the selected area of specialization. The examination will be in two parts (one written, one oral), and will normally be completed within a two-week period. Upon completing it satisfactorily, the student is deemed to have met the departmental standards and becomes a candidate for the DVSc degree.

The qualifying examination is an examination by the academic unit in which the student is enrolled and the examination committee is appointed by the Interdepartmental DVSc Program Committee. The examination is conducted by a committee consisting of five members, as follows:

- The chair of the program committee, who acts as chair of the examination committee;
- Two members of the graduate faculty who are not members of the advisory committee, at least one of whom must be a member of the department in which the student is registered;
- Two members of the advisory committee.

The qualifying examination will primarily assess the student's knowledge of the area of specialization, the basic sciences supporting this area, and to a lesser extent, the student's area of research. The student's general ability to integrate and apply this knowledge is also assessed. In addition, the examination committee will take into account a written

submission from the student's advisory committee evaluating the quality of the student's applied skills and performance to date in the program.

The student is deemed to have passed the qualifying examination if not more than one of the examiners votes negatively. An abstention is regarded as a negative vote. The results of the qualifying examination will be reported to the dean of Graduate Studies through the chair of the program committee. The report to the dean will record the decision as unsatisfactory or satisfactory. If unsatisfactory, the student may be given a second attempt at the examination. A student who fails the qualifying examination and who is being given a second opportunity to pass the examination will be required to repeat it no later than six months after the failed attempt. Academic units may impose a shorter time limit. A second unsatisfactory constitutes a recommendation to the Board of Graduate Studies that the student be required to withdraw (see Unsatisfactory Progress and Appeals of Decision).

Thesis

Each candidate shall prepare a thesis on the approved research project. 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 communicate in writing in a satisfactory style.

The thesis will be based on the research project carried out in the DVSc program. Like all theses, it will contain a detailed critical review of the pertinent theoretical and empirical literature and place the work in the context of existing knowledge in the field. The hypotheses, research design, results, and discussion of the results will be presented in normal thesis format as approved by the Faculty of Graduate Studies.

External Examiner

For each doctoral thesis, an external examiner from outside the university is appointed on behalf of the dean of Graduate Studies by the department chair, in consultation with the advisor and the program committee chair. The nomination will be made when the candidate's advisor declares that the thesis is about to be prepared, normally no later than the beginning of the student's last semester. The external examiner will submit a written appraisal of the thesis (at least seven days prior to the examination) to the chair of the department who will then provide these comments to the candidate and the Advisory Committee. The external examiner is expected to participate in the final oral examination and to assist in evaluating all aspects of the candidate's performance.

Procedures

The thesis may be submitted at any time of the year, but candidates are advised to allow ample time for revision and examination. A copy of the schedule of deadlines should be obtained from Graduate Program Services by the candidate no later than the beginning of the semester in which the candidate intends to graduate.

It is understood that, as the thesis is being written, the candidate will be in regular communication with the advisory committee. When a draft is completed which the advisory committee recommends for examination, the candidate, with the endorsement of the departmental chair, formally requests an examination. A copy of the final draft is then sent to the external examiner as fair copy of the thesis. Arrangements for the final oral examinations are made. It is understood that as a result of the final oral examination corrections may be necessary to produce a revised final draft of the thesis.

Final Oral Examination

The final examination is devoted chiefly, but not necessarily entirely, to the defence of the thesis. It is a faculty (as distinct from a departmental) examination, for which the arrangements are made by the department and the college on behalf of the faculty in consultation with Graduate Program Services.

The examination is conducted by a committee consisting of five members, as follows:

- The chair of the program committee, who acts as chair of the examination committee;
- The external examiner;
- A member of the graduate faculty who is not a member of the advisory committee, selected by the department chair;
- Two members of the student's advisory committee, selected by the advisory committee.

The dean of Graduate Studies, or a designate, may attend a part or all of the examination. The examination is open to the public and members of the audience may question the candidate only upon invitation of the chair of the committee.

The members of the examination committee, including the external examiner, report individually on the final examination and the thesis. The candidate is deemed to have passed if no more than one of the five examiners votes negatively. An abstention is regarded as a negative vote. Concurrently, the members sign the Certificate of Approval, which is submitted with the approved thesis in its final form to Graduate Program Services (see Submission of Thesis). The report to the dean of Graduate Studies will record the decision as unsatisfactory or satisfactory. If unsatisfactory, the candidate may be given a second attempt. A second unsatisfactory result constitutes a recommendation to the Board of Graduate Studies that the student be required to withdraw (see Unsatisfactory Progress and Appeals of Decisions).

Copies of Thesis

Two unbound copies of the certified thesis must be submitted to Graduate Program Services by the deadline date shown in the Academic Schedule in the calendar. Both copies must

include the Certificate of Approval signed by the external examiner and the members of the examination committee. Also included must be a copy of an abstract consisting of no more than 350 words and a copy of the circulation waiver and the copying licence.

Publication

The Certificate of Approval indicates that the thesis is suitable for publication. The university requires publication of the thesis in the following manner:

One unbound copy of the thesis is forwarded to the National Library of Canada, together with an agreement form signed by the candidate authorizing the National Library to microfilm the thesis and to make copies available for sale on request. The National Library will film the thesis exactly as it is and will list the thesis in Canadiana as a publication of the National Library.

The National Library's Microfilm Publication Agreement will be sent to the candidate prior to the final oral examination, to be signed and submitted to Graduate Program Services immediately after the successful completion of the examination.

An abstract of not more than 350 words, prepared by the author and approved by the advisor, is forwarded by the National Library to the publishers of American Doctoral Dissertations. The abstract is printed in this work and the availability of the thesis in microfilm at the National Library is announced.

The candidate, in consultation with the advisor and the department chair, shall have the right to request that circulation and/or copying of the thesis in any form be withheld for up to one year.

Publication in the above manner does not preclude publication of all or part of the thesis in journals or in book form.

Departmental Regulations

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

Master of Arts, Master of Engineering, Master of Science, Master of Science (Aquaculture) and Master of Science (Planning)

Admission

Admission to a master's degree program as a regular student is granted, on the recommendation of the department concerned, to:

- the holder of an honours baccalaureate or its equivalent, as set out in the Admission Requirements; or
- a student who has satisfied the requirements for transfer from the provisional student category.

Minimum Duration

At least two semesters of full-time study must be devoted to the master's program if the student is admitted as a regular student. A student admitted as a provisional student requiring two semesters in that category, must spend at least one additional semester as a regular full-time student. For a student registered part-time, the minimum duration period is based on the equivalence of three part-time semesters to one full-time semester.

Completion

Normally, a thesis must be formally submitted (see Submission of Thesis) or the program otherwise completed, within forty-eight months of the completion of the minimum duration. Candidates must understand, however, that announced departmental policy may require completion of the degree requirements within a briefer time period.

Advising

The student's program is established and progress kept under review by the academic unit in which the student is enrolled (see Enrolment and Registration). The day-to-day responsibility will rest with the advisor. There will be an advisory committee of at least two graduate faculty members, the chair of which committee is normally the advisor of the student's program. Departments and schools are encouraged to involve graduate faculty from other academic units as members of advisory committees.

Courses

The MA, MEng, MSc, MSc (Aqua) and MSc (Plan) degrees of the University of Guelph require the demonstration of a reasonable mastery of a concentrated field of study. This may be attested by the achievement of satisfactory standings in a number of courses, as determined by the department. In most cases a thesis is also required.

Prescribed Studies

The proportion of weight attached to the research and thesis may vary, even within a department. Accordingly, the number of courses may correspondingly vary. Where the student's program requires a thesis, the number of credits will not be fewer than 1.5, which must be made up entirely of graduate level courses. Any courses selected which exceed the 1.5 minimum credits must also be acceptable to the department and the dean of Graduate Studies for credit towards the graduate degree. These "substantive" courses

comprise the candidate's prescribed studies, in which the student must obtain an overall weighted average grade of at least 'B-' standing (see Establishment of Program and Prescribed Studies).

Additional Courses

In addition to the prescribed studies the candidate may take ancillary courses supportive of the special discipline. These courses may be at either the undergraduate or the graduate level.

Degree by Courses

In some disciplines, the interests of a master's student may be better served through concentration on course work rather than combining course work with research. In such circumstances the prescribed *studies* will consist of courses. Where the student's program does not require a thesis, the number of course credits will not be fewer than 3.5. One (1.0) or more of the credits must be for the satisfactory completion of a special project or, in some cases, a major essay or paper. In some departments the major research paper takes the place of 1.0 of the total credits required. OCGS by-laws permit a maximum of 1/3 of the credits to be taken from senior undergraduate courses; however individual programs may require a higher proportion of graduate courses.

Research

In most disciplines, students may pursue their degree through course work and independent research towards the completion of a thesis. In the total program of a degree by thesis, the equivalent of at least one full-time semester must be devoted to thesis research. To avoid undue prolongation of the student's program, the research topic should be identified early and approved by the advisory committee.

Thesis

For the master's degree by thesis each candidate shall submit a thesis, expressed in satisfactory literary form, based upon research in some topic connected with the candidate's special discipline. The thesis must demonstrate the candidate's capacity for original and independent work, and should include a critical evaluation of work which has previously been done in the candidate's field of research. The thesis should emphasize any new conclusions which may be drawn from the candidate's own research.

For purposes of equivalency calculations, a master's thesis is generally considered to be the equivalent of 2.0 credits.

Procedures

The thesis may be submitted at any time of the year, but candidates are encouraged to have the final examination well in advance of the deadline date for thesis submission. Candidates should be aware of the deadlines schedule, a copy of which may be obtained in Graduate Program Services. Candidates should discuss their thesis write-up with their advisors early in their final semester.

As the thesis is being written, the candidate is expected to be in regular communication with the advisory committee. The draft thesis is sent to the members of the advisory committee. When a draft is completed which the advisory committee recommends for examination, the final draft is sent to the members of the master's examination committee and the final oral examination is held.

Following the master's examination the candidate, if successful, arranges for the preparation of the thesis in final form, and for its submission to the dean (see below). The thesis in final form must include any minor corrections or revisions resulting from the examination. Approval of the thesis takes the form of a Certificate of Approval, signed by the examination committee.

Master's Examination

The final oral examination, devoted chiefly to the defence of the thesis, is a departmental examination identified as the master's examination. The master's examination committee normally consists of three or four members appointed by the department chair, as follows:

- A member of the graduate faculty of the department, who is not a member of the advisory committee, to act as chair of the master's examination committee and to make arrangements therefor;
- A member of the candidate's advisory committee (normally, the advisor);
- A member of the associated graduate faculty or of the graduate faculty who may be a member of the advisory committee;
- A fourth member may be appointed from among graduate faculty from another department, from the department or from the advisory committee, according to departmental and/or examination requirements.

If possible, a member of another department should be included on the committee.

The examination is open to the public; members of the audience may question the candidate only upon invitation of the chair of the committee.

The examination is passed and the thesis approved if there is no more than one negative vote. An abstention is regarded as a negative vote. The report to the dean of Graduate Studies will record the decision as unsatisfactory or satisfactory. If unsatisfactory, the candidate may be given a second attempt. A second unsatisfactory result constitutes a recommendation to the Board of Graduate Studies that the student be required to withdraw (see Unsatisfactory Progress and Appeals of Decisions).

Copies of Thesis

Two unbound copies of the certified thesis must be submitted to Graduate Program Services by the deadline date shown in the Academic Schedule in this calendar. Both copies must include the Certificate of Approval signed by the examination committee. Also included must be a brief abstract consisting of no more than 150 words, a copy of the circulation waiver, and the copying licence.

Publication

The university requires publication of the thesis in the following manner:

One unbound copy of the thesis is forwarded to the National Library of Canada, together with an agreement form signed by the candidate authorizing the National Library to microfilm the thesis and to make copies available for sale on request. The National Library will film the thesis exactly as it is and will list the thesis in *Canadiana* as a publication of the National Library.

The National Library's Microfilm Agreement form will be sent to the candidate prior to the master's examination, to be signed and submitted to the dean of Graduate Studies immediately after the successful completion of the examination.

An abstract of not more than 150 words, prepared by the author and approved by the advisor, is forwarded by the National Library to the publishers of *Masters Abstracts International*. The abstract is printed in this work and the availability of the thesis in microfilm at the National Library is announced.

The candidate, in consultation with the advisor and the department chair, shall have the right to request that circulation and/or copying of the thesis in any form be withheld for up to one year.

Department Regulations

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

Master of Applied Nutrition

Admission

Admission to the Master of Applied Nutrition (MAN) program as a regular student is granted, on the recommendation of the Department of Family Relations and Applied Nutrition, to:

- the holder of an honours baccalaureate degree from a dietetic program accredited by Dietitians of Canada, or with equivalent academic content as judged by the Applied Human Nutrition faculty, with academic standing as set out in Admission Requirements, or
- a student who has satisfied the requirements for transfer from the provisional student category.

Minimum Duration

At least three semesters of full-time study must be devoted to the master's program if the student is admitted as a regular student.

Completion

Normally the program must be completed within twelve months of the completion of the minimum duration.

Advising

The student's program is established and progress is kept under review by the Department of Family Relations and Applied Nutrition. The day-to-day responsibility will rest with the MAN Program Coordinator. There will be a MAN Advisory Committee of at least three graduate Applied Human Nutrition faculty, the chair of which is the MAN Program Coordinator.

Courses

The MAN degree of the University of Guelph requires the demonstration of a reasonable mastery of a concentrated field of study. This may be attested by the achievement of satisfactory standings in a number of courses, as determined by the department. A thesis is not required.

Prescribed Studies

The courses selected must be acceptable to the school and to the dean of Graduate Studies for graduate credit. The candidate must obtain an overall weighted average grade of at least 'B-' in order to qualify for the degree.

A total of seven courses (6.5 credits) are required for the completion of this program, made up of three regular courses, three practicum courses and a major project.

Additional Courses

In addition to the prescribed studies, the student may take ancillary courses supportive of the special discipline. These courses may be at either the undergraduate or the graduate level.

Professional Competence

Throughout the MAN program, students will document completion of the Dietitians of Canada Entry-Level Competencies. Graduates who have completed all required competencies successfully, as assessed by the MAN Advisory Committee, can apply to write the examination and qualify as a member of the College of Dietitians of Ontario (CDO), or other provincial dietetics regulatory body.

Departmental Regulations

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

Master of Business Administration (Agriculture) (distance)

The University of Guelph offers an electronically delivered MBA focused on agriculture. Participants are linked from home or their workplace with a network of learners and professors.

Admission

Admission as a regular student is granted, on recommendation of the department concerned, to:

- the holder of an honours baccalaureate or its equivalent (from a recognized university or college) with an average standing of at least a 'B' (second-class honours) in the last four semesters or the last two undergraduate years (full-time or equivalent). At least three years of managerial experience is also required. The holder of:
- the holder of:
 - a general degree and/or;
 - a diploma in agriculture and/or;
 - an acceptable professional designation, having completed at least five years of managerial experience showing progressive increase in responsibility.

The university reserves the right to request Graduate Management Admission Test (GMAT) results in certain circumstances.

The applicant must have confirmed access to computer equipment, including a modem.

Program Duration

Students normally complete the MBA in Agriculture in two to three years. Course modules are completed in pre-determined sequence within a phase schedule, and are typically two months in length. On average, students allot 20 to 25 hours per week for study and participation in the program.

Completion

Students must complete the program within six years.

Program Requirements

The MBA in Agriculture is completed in three phases:

Phase One

offered through Athabasca University, requires participants to complete six core management courses which provide a foundation for graduate management and accounting education. Phase One is normally completed within 15 months. Upon successful completion, students are awarded a Graduate Diploma in Management (GDM) from Athabasca University. Continuation into Phase Two of the MBA program is contingent upon successful completion of the GDM.

Phase Two

contains a six-day intensive course on the University of Guelph campus, where participants meet to further develop the skills learned in Phase One and to prepare for Phase Two. This week focuses on the development of a full management plan for an agribusiness organization. Six courses in applied aspects of agricultural management are required for Phase Two.

Phase Three

is comprised of a project-based dissertation in an applied agribusiness situation which is a major piece of research requiring data collection, analysis and the ability to link understanding of the problem with an appropriate body of literature.

Program Fees

Tuition for the MBA in Agriculture program is payable at the beginning of each phase. Phase One tuition and admission fees, including software and software licences, are directed to Athabasca University. Tuition for subsequent phases, and registration and residency fees are payable to the University of Guelph. Phase Two tuition includes costs for accommodation and meals for the intensive six-day residency session. Contact the MBA in Agriculture office for details.

Faculty of Management Master of Business Administration (Business Studies)

Admission

Admission as a regular student is granted, on recommendation of the department concerned, to:

- the holder of an honours baccalaureate or its equivalent (from a recognized university or college) with an average standing of at least a 'B' (second-class honours) in the last four semesters or the last two undergraduate years. Two letters of recommendation from former professors and/or employers or colleagues are required. At least two years of managerial experience is also required. Or,
- a student who has satisfied the requirements for transfer from provisional student category.

Applicants are required to submit results of the Graduate Management Admission Test (GMAT) in addition to the normal documentation required for evaluation.

Minimum Duration

At least three semesters of full-time study must be devoted to the master's program if the student is admitted as a regular student. For a student registered part-time the minimum duration period is based on the equivalence of three part-time semesters to one full-time semester.

Completion

Normally, the program must be completed within forty-eight months of the completion of the minimum duration. Candidates must understand, however, that announced department policy may require completion of the degree requirements within a briefer time.

Advising

The student's program is established and progress kept under review by the department concerned (see Enrolment and Registration). The day-to-day responsibility will rest with an advisory committee, consisting of at least two graduate faculty members, one of whom may be from outside the department. The student's advisor is chair of the advisory committee.

Courses

The MBA degree of the University of Guelph requires the demonstration of a reasonable mastery of a concentrated field of study. This is attested by achieving satisfactory standings in a number of courses.

Prescribed Studies

The coursework-and-major-paper option requires 16 graduate courses (8.0 credits) plus a 0.5-credit major paper. There are nine core courses which must be taken by all MBA students. An additional nine courses (including the 0.5-credit major paper and electives) are determined according to the department of registration. The courses selected must be acceptable to the school and the dean of Graduate Studies for graduate credit. These substantive courses comprise the candidate's prescribed studies, in which the student must obtain an overall average grade of at least 'B-' (see Establishment of Program and Prescribed Studies).

Additional Courses

In addition to these prescribed studies the candidate may take ancillary courses supportive of the special discipline. These courses may be at either the undergraduate or the graduate level.

Department Regulations

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

Master of Business Administration (Hospitality and Tourism)

Admission

Admission to a master's degree program as a regular student may be granted, on recommendation of the School of Hotel and Food Administration, to:

- the holder of an honours baccalaureate or its equivalent as set out in the Admission Requirements; or
- a student who has satisfied the requirements for transfer from provisional student category.

Applicants are required to submit results of the Graduate Management Admission Test (GMAT) in addition to the normal documentation required for evaluation.

Delivery Method

The MBA Program is offered in two different ways, as a one year residential program, and also electronically over a two year period to accommodate those professionals who

are unable to take a full year away from their careers. For the electronic program, participants are linked from home or their workplace with a network of learners and professors. Tuition and related costs for the electronic program are managed by the School of Hotel and Food Administration; contact that office for details.

Minimum Duration

At least three semesters of full-time study must be devoted to the master's program if the student is admitted as a regular student. Credit may be allowed for up to one semester of previous graduate study. For a student registered part-time, the minimum duration period is based on the equivalence of three part-time semesters to one full-time semester.

Completion

Normally, the thesis must be formally submitted (see Submission of Thesis) or the program otherwise completed within forty-eight months of the completion of the minimum duration. Candidates must understand, however, that announced school policy may require completion of the degree requirements within a briefer time.

Advising

The student's program is established and progress kept under review by the school (see Enrolment and Registration). The day-to-day responsibility will rest with the advisor. There will be an advisory committee of at least two graduate faculty members. The chair of the committee is normally the advisor of the student's program. The school is encouraged to involve graduate faculty from other academic units as members of advisory committees.

Courses

Students may pursue the MBA degree either by a research-based thesis option or by major paper and course work. The MBA degree of the University of Guelph requires the demonstration of a reasonable mastery of a concentrated field of study. This is attested by achieving satisfactory standings in a number of courses.

Prescribed Studies

The research-based thesis option requires at least thirteen graduate courses (6.5 credits) plus the thesis. At least five of the graduate courses must be taken in the school. The coursework-and-major-paper option requires thirteen graduate courses (6.5 credits) plus a 1.0-credit major paper. At least six of the courses must be taken in the school. The courses selected must be acceptable to the school and the dean of Graduate Studies for graduate credit. These substantive courses comprise the candidate's prescribed studies, in which the student must obtain an overall weighted average grade of at least 'B-' standing (see Establishment of Program and Prescribed Studies).

Additional Courses

In addition to these prescribed studies the candidate may take ancillary courses supportive of the special discipline. These courses may be at either the undergraduate or the graduate level.

Research

In the total program of the research-based thesis option, the equivalent of at least one full-time semester must be devoted to research in fulfilment of the thesis requirement. In order to avoid undue prolongation of the student's program, the research topic should be identified early and approved by the advisory committee.

Thesis

See Thesis procedures for MA, MEng, and MSc degrees.

External Examiner

To advise on the thesis and to participate in the master's examination of students in the thesis option, an external examiner from outside the university may be appointed by the school director, in consultation with the advisor and the graduate co-ordinator. The external examiner will submit a written appraisal of the thesis to the school director. The external examiner is expected to attend the master's examination and to assist in evaluating all aspects of the candidate's performance.

Master's Examination

The final oral examination, devoted chiefly to the defence of the thesis, is a school examination identified as the master's examination. The master's examination committee normally consists of three or four members appointed by the school's director, as follows:

- A member of the graduate faculty of the school who is not a member of the advisory committee, to act as chair of the master's examination committee and to make arrangements therefor;
- A member of the candidate's advisory committee (normally, the advisor);
- A member of the associated graduate faculty or of the graduate faculty who may be a member of the advisory committee;
- A fourth member may be appointed from among graduate faculty from another department, from the school or from the advisory committee, according to school and/or examination requirements. The fourth member may be an external examiner.

If possible, a member of another department should be included on the committee.

The department chair is responsible for notifying the dean of the composition of the committee and for reporting to the dean the outcome of the examination.

The examination is open to the public; members of the audience may question the candidate only upon invitation of the chair of the committee.

The examination is passed and the thesis approved if there is no more than one negative vote. An abstention is regarded as a negative vote. The report to the dean of Graduate Studies will record the decision as unsatisfactory or satisfactory. If unsatisfactory, the candidate may be given a second attempt. A second unsatisfactory result constitutes a recommendation to the Board of Graduate Studies that the student be required to withdraw (see Unsatisfactory Progress and Appeals of Decisions).

School Regulations

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

Master of Fine Arts

Admission

Admission as a regular student may be granted, on recommendation of the School of Fine Art and Music, to:

- the holder of a BFA degree (honours equivalent), or an honours BA or its equivalent in fine or visual arts, as set out in the Admission Requirements; or
- 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
- a student who has satisfied the requirements for transfer from provisional student category.

Each applicant must also submit a portfolio or other appropriate documentation of artwork.

Minimum Duration

At least four semesters of full-time study must be devoted to the master's program if the student is admitted as a regular student. For a student registered part-time, the minimum duration is based on the equivalence of three part-time semesters to one full-time semester.

Completion

Normally, the thesis must be formally submitted (see Submission of Thesis) or the program be otherwise completed within forty-eight months of the completion of the minimum duration. Candidates must understand, however, that announced school policy may require completion of the degree requirements within a briefer time.

Advising

The student's program is established and progress kept under review by the school (see Enrolment and Registration). The day-to-day responsibility will rest with an advisor. There will be an advisory committee of at least three graduate faculty members. The chair of the committee is normally the student's advisor. The school is encouraged to involve graduate faculty from other academic units as members of advisory committees.

Courses

The MFA degree at the University of Guelph requires the attainment of a professional level of studio practice and a detailed knowledge of the selected field of specialization.

Prescribed Studies

A total of twelve graduate courses (10.0 credits) are required for the completion of this program. In addition to individually oriented studio courses, students are required to complete four MFA seminars, two teaching practicum courses, and two graduate art history, theory or criticism courses. These substantive courses comprise the candidate's prescribed studies, in which the student must obtain an overall weighted average grade of at least 'B-' (see Establishment of Program and Prescribed Studies). A maximum of two courses outside the School of Fine Art and Music may be substituted for the art history, theory and criticism courses with the approval of the school and the dean of Graduate Studies.

Additional Courses

In addition to the prescribed studies, the student may take ancillary courses supportive of the special discipline. These courses may be at either the undergraduate or the graduate level.

Exhibition/Paper

Each degree candidate will complete a thesis. The MFA thesis consists of an exhibition, a brief supporting paper and an oral examination. Each degree candidate must present an exhibition, performance, or showing of the studio work, as well as a brief critical paper of approximately 1,000 words that articulates the aesthetic, historical and technical issues pertinent to the artwork. The submitted studio work must demonstrate a professional level of competence and a significant aesthetic investigation, as approved by the candidate's master's examination committee.

External Examiner:

To advise on the exhibition/paper and to attend the master's examination, an external examiner from outside the university may be appointed by the school director, in consultation with the advisor and the graduate co-ordinator. The external examiner will

submit a written appraisal of the exhibition/paper to the school director. The external examiner is expected to attend the master's examination and to assist in evaluating all aspects of the candidate's performance

Procedures

The exhibition/paper may be completed at any time of the year, but candidates must bear in mind the desirability of having the final examination as much in advance of the deadline date as possible. Candidates should be aware of the deadlines schedule, a copy of which may be obtained in Graduate Program Services. Candidates should discuss their thesis write-up with their advisors early in the final semester.

Following the master's examination, the candidate, if successful, will submit the paper and the photographic record of the exhibition to the school where they will be retained permanently.

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. The master's examination committee normally consists of three or four members appointed by the school director, as follows:

- A member of the graduate faculty of the school, who is not a member of the advisory committee, to act as chair of the master's examination committee and to make arrangements therefor.
- A member of the candidate's advisory committee (normally, the advisor);
- A member of the associated graduate faculty or of the graduate faculty who may be a member of the advisory committee;
- A fourth member may be appointed from among graduate faculty from another department, from the school or from the advisory committee, according to school and/or examination requirements. The fourth member may be an external examiner.

If possible, a member of another department should be included on the committee.

The school director is responsible for notifying the dean of the composition of the committee, and for reporting to the dean the outcome of the examination.

The examination committee is expected to review the exhibition and the critical paper. The student is examined orally on the contents of the exhibition and the paper. Viewing the exhibition may take place over several days; the oral examination should take place following the viewing and must involve all members of the examination committee, including the external examiner (if applicable), as well as the candidate. Both of these components constitute the master's examination. The examination is open to the public; members of the audience may question the candidate only upon invitation of the chair of the examination committee.

The examination is passed and the exhibition/paper approved if there is no more than one negative vote. An abstention is regarded as a negative vote. The report to the dean of Graduate Studies will record the decision as unsatisfactory or satisfactory. If unsatisfactory, the candidate may be given the opportunity of a second attempt. A second unsatisfactory result constitutes a recommendation to the Board of Graduate Studies that the student be required to withdraw (see Unsatisfactory Progress and Appeals of Decisions).

Copies of the Paper

A photographic record of the exhibition and a copy of the critical paper is retained in the school.

School Regulations

In addition to meeting the university MFA regulations regarding the 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 for inclusion in the school archives.

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

Master of Landscape Architecture

Admission

Admission as a regular student is granted, on the recommendation of the Landscape Architecture program, to:

- the holder of a BLA degree, or of an honours baccalaureate or its equivalent, as set out in the Admission Requirements, or
- a student who has satisfied the requirements for transfer from provisional student category.

Minimum Duration

At least four semesters of full-time study must normally be devoted to the master's program if the student holds a BLA and is admitted as a regular student. Holders of other degrees may require two additional semesters. For a student registered part-time, the minimum duration is based on the equivalence of three part-time semesters to one full-time semester.

Completion

Normally, the thesis must be formally submitted (see Submission of Thesis) or the program otherwise completed within forty-eight months of the completion of the minimum duration.

Advising

The student's program is established, and progress kept under review, through the Landscape Architecture program (see Enrolment and Registration). The day-to-day responsibility will rest in an advisory committee of at least two members, one of whom may be from outside the school. The student's research advisor is chair of the advisory committee.

Courses

The MLA degree of the University of Guelph requires the demonstration of a general mastery of the field of landscape architecture, and a detailed knowledge of the selected field of specialization.

Prescribed Studies

The courses selected must be acceptable to the school and to the dean of Graduate Studies for graduate credit. The candidate must obtain an overall weighted average grade of at least 'B-' in order to qualify for the degree.

The number of courses prescribed will depend upon the student's background.

- For the holder of a BLA with several subsequent years of significant professional experience (as defined by the school), the prescribed studies will consist of at least five graduate courses (2.25 credits), plus a thesis;
- For the holder of a BLA without several subsequent years of significant professional experience (as defined by the school), the prescribed studies will consist of at least seven graduate courses (3.25 credits), plus a thesis;
- for the holder of degrees other than the BLA, the prescribed studies will consist of at least thirteen graduate courses (6.25 credits), plus a thesis.

Additional Courses

In addition to the prescribed studies, a student may take courses outside the discipline. These courses may be at either the undergraduate or the graduate level.

Research

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

Thesis

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

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

Procedures

The thesis may be submitted at any time of the year, but candidates are encouraged to have the final examination well in advance of the deadline date for thesis submission. Candidates should be aware of the deadlines schedule, a copy of which may be obtained in Graduate Program Services. Candidates should discuss their thesis write-up with their advisors early in their final semester.

As the thesis is being written, the candidate is expected to be in regular communication with the advisory committee. The draft thesis is sent to the members of the advisory committee. When a draft is completed which the advisory committee recommends for examination, the final draft is sent to the members of the master's examination committee and the final oral examination is held.

Following the master's examination the candidate, if successful, arranges for the preparation of the thesis in final form, and for its submission to the dean (see below). The thesis in final form must include any minor corrections or revisions resulting from the examination. Approval of the thesis takes the form of a Certificate of Approval, signed by the examination committee.

Master's Examination

The final oral examination, devoted chiefly to the defence of the thesis, is a departmental examination identified as the master's examination. The master's examination committee normally consists of three or four members appointed by the department chair or graduate coordinator, as follows:

- A member of the graduate faculty of the department, who is not a member of the advisory committee, to act as chair of the master's examination committee and to make arrangements therefor;
- A member of the candidate's advisory committee (normally, the advisor);
- A member of the associated graduate faculty or of the graduate faculty who may be a member of the advisory committee;
- A fourth member may be appointed from among graduate faculty from another department, from the department or from the advisory committee, according to departmental and/or examination requirements.

If possible, a member of another department should be included on the committee.

The examination is open to the public; members of the audience may question the candidate only upon invitation of the chair of the committee.

The examination is passed and the thesis approved if there is no more than one negative vote. An abstention is regarded as a negative vote. The report to the dean of Graduate Studies will record the decision as unsatisfactory or satisfactory. If unsatisfactory, the candidate may be given a second attempt. A second unsatisfactory result constitutes a recommendation to the Board of Graduate Studies that the student be required to withdraw (see [Unsatisfactory Progress](#) and [Appeals of Decisions](#)).

Copies of Thesis

Two unbound copies of the certified thesis must be submitted to Graduate Program Services by the deadline date shown in the Academic Schedule in this calendar. Both copies must include the Certificate of Approval signed by the examination committee. Also included must be a brief abstract consisting of no more than 150 words, a copy of the circulation waiver, and the copying licence.

Publication

The university requires publication of the thesis in the following manner:

One unbound copy of the thesis is forwarded to the National Library of Canada, together with an agreement form signed by the candidate authorizing the National Library to microfilm the thesis and to make copies available for sale on request. The National Library will film the thesis exactly as it is and will list the thesis in *Canadiana* as a publication of the National Library.

The National Library's Microfilm Agreement form will be sent to the candidate prior to the master's examination, to be signed and submitted to the dean of Graduate Studies immediately after the successful completion of the examination.

An abstract of not more than 150 words, prepared by the author and approved by the advisor, is forwarded by the National Library to the publishers of *Masters Abstracts International*. The abstract is printed in this work and the availability of the thesis in microfilm at the National Library is announced.

The candidate, in consultation with the advisor and the department chair, shall have the right to request that circulation and/or copying of the thesis in any form be withheld for up to one year.

Program Regulations

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

Graduate Diploma: International Rural Development Planning

The School of Environmental Design and Rural Development (Rural Planning and Development) offers a Graduate Diploma program in International Rural Development Planning for professionals in this field.

Admission

Admission to this program as a regular student is granted, on recommendation of the school, to:

- the holder of a three-year or honours baccalaureate (Canadian equivalent, from a recognized university or college) with an average standing of at least 'B' (second-class honours in the last four semesters or the last two undergraduate years. Significant responsible professional experience in rural development is also required; or
- a student who has satisfied the requirements for transfer from provisional student category

Minimum Duration

At least three semesters of full-time study must be devoted to the diploma program. For a student registered part-time, the minimum duration period is based on the equivalence of three part-time semesters to one full-time semester

Advising

The student's program is established and progress kept under review by the school (see Enrolment and Registration). The day-to-day responsibility will rest with the advisor. There will be an advisory committee of at least two graduate faculty members. The chair of the committee is normally the advisor of the student's program. Graduate faculty members from other academic units may serve as members of advisory committees.

Courses

The postgraduate diploma program requires the demonstration of a reasonable mastery of a concentrated field of study. This is attested by achieving satisfactory standings in a minimum number of graduate courses equivalent to 2.5 credits.

Prescribed Studies

The program requires the completion of five graduate courses (2.5 credits), including a major professional paper (0.5), as well as field studies course(s). At least three of the courses (1.5 credits) must be taken in the school. The courses selected must be acceptable to the school and the dean of Graduate Studies for graduate credit. These substantive courses comprise the candidate's prescribed studies, in which the student must obtain an overall weighted average grade of at least 'B-' (see Establishment of Program and Prescribed Studies).

Additional Courses

In addition to these prescribed studies, the candidate may take ancillary courses supportive of the special discipline. These courses may be at either the undergraduate or the graduate level.

School Regulations

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

Graduate Diploma: Veterinary Specializations

Graduate diplomas are awarded to those who successfully complete special postgraduate diploma programs offered by the Departments of Pathobiology and Clinical Studies in the Ontario Veterinary College.

Admission

Admission to a postgraduate diploma program as a regular student may be granted on recommendation of the department to the holder of a recognized veterinary degree at the honours baccalaureate (or equivalent) level with at least second-class honours ('B-') in the work of the final two years.

Minimum Duration

At least three semesters of full-time study must be devoted to the diploma program. For a student registered part-time, the minimum duration period is based on the equivalence of three part-time semesters to one full-time semester.

Advising

The student's program is planned and the student's progress is kept under review by the department.

Courses

The postgraduate diploma program requires the completion of regular graduate courses together with special professional or applied courses. The curriculum for the graduate diploma is laid down by the department. In order to qualify for graduation, the student must obtain an overall weighted average grade of at least 'B-' in the required courses (see Prescribed Studies). Details may be obtained from the chair of the Department of Pathobiology or the Department of Clinical Studies. A thesis is not required.

V. Other Study Options

This section describes other study options that exist for graduate students outside of their own program of study. It includes information on the International Study Option, the University Teaching course, Animal Care Short course and other University courses.

Animal Care Short Course

All graduate students utilizing animals at the University of Guelph must demonstrate that they are familiar with animal welfare issues and adequately trained in animal care and use. The overall objective is to introduce aspects of laboratory animal science, animal welfare and animal care, not to provide definitive answers. Specific objectives of the course are as follows: (1) to familiarize course participants with existing regulations and guidelines to explain the need for them; (2) to demonstrate the need for understanding animal care and welfare both for protecting the user and the animal from potentially harmful zoonoses and to help improve the quality of research and teaching; and (3) to put into perspective the moral and ethical obligations to the animal so the user can weigh objectively the costs to animals against benefits gained from their use.

Formal recognition on the graduate transcript is accorded to graduate students who successfully complete the Animal Care Short Course. This course is offered annually by the Animal Care Committee and by the Centre for the Study of Animal Welfare of the University of Guelph.

Admission

The Animal Care Short Course is mandatory for all graduate students who will utilize vertebrate animals in their research and/or who will be teaching assistants in any course involving vertebrate animals. Students must take this course as early as possible in their program. In some circumstances, equivalency may be accepted. Students wishing to apply for equivalency should contact the Director, Animal Care Committee.

Format

The course is offered before the beginning of classes in each Winter semester. It is a one-day, 7-hour program covering topics relevant to animal care.

Credit

Following the course, the Animal Care Committee will forward a list of the participants in the course to Graduate Program Services. The course will be entered on the students' official record, with a grade notation of SAT (satisfactory).

UNIV*6600 Animal Care Short Course W [0.00]

A one-day seminar covering the following topics: Animal Welfare Philosophy, Ethological Considerations in Animal Management, Assessing Animal Welfare, Ethical Dilemmas, Regulations and Legislation, Euthanasia, Improving Statistical Power, Zoonoses and Biohazards, Recognition and Alleviation of Pain and Distress in Animals, Case Study Evaluation.

Registration

Please register via email or voicemail with Pat Fleming, Animal Care Services (pfleming@uoguelph.ca OR x54310). Please include your name, student ID number, department, advisor and a contact telephone number.

International Study Option

Formal recognition on the graduate transcript is accorded graduate students who successfully complete a period of study in another country as part of their program at Guelph. The study must be an integral part of the student's approved graduate studies. Credit will not be granted for international study commenced or completed prior to approval of the student's study plan by the dean of Graduate Studies.

Admission

Admission to the international study option may be granted to any registered graduate student on the recommendation of the department. Application forms are available in Graduate Program Services.

Minimum and Maximum Durations

The minimum duration of study is six weeks abroad and the maximum duration is one year.

Advising

The student's international study is planned and progress kept under review by the department and the student's advisory committee.

Activities

Credit for the international study option is dependent on the completion of a study approved by the department. Details may be obtained from Graduate Program Services. A written report on the study is required, a copy of which must be submitted to the dean of Graduate Studies. Upon approval of the written report in Graduate Program Services, the following course is added to the student's academic record with a grade notation of SAT (satisfactory).

UNIV*6500 International Study Option U [0.00]

A period of study in another country as part of a graduate program at the University of Guelph. Details may be obtained from Graduate Program Services.

University Teaching: Theory and Practice

Formal recognition on the graduate transcript is accorded to graduate students who successfully complete the course University Teaching: Theory and Practice. This program provides an opportunity to examine teaching and learning issues and to develop teaching skills appropriate to higher education. During the program, participants address the following topics: life as an academic, the characteristics of effective university teaching, students' learning styles, teaching options in class/laboratory/seminar settings, planning a class/course/curriculum, and helping students become effective problem-solvers.

Admission

All registered graduate students are eligible for admission. Priority may be given to students nearing the end of their degree programs if restricted enrolment is necessary. Interested students should contact Teaching Support Services, which administers the program.

Format

The program normally consists of twelve two-hour sessions at two-week intervals during the fall and winter semesters. Students wishing credit for the program register in the fall and winter semesters for the course below. Students who do not wish to complete the course must formally drop the course by the 5th class day of the Winter semester.

UNIV*6800 University Teaching: Theory and Practice F-W [0.50]

Participants will critically examine aspects of teaching in higher education and develop teaching skills such as lecturing, demonstrating, leading discussions, and problem solving. Satisfactory (SAT) or unsatisfactory (UNS) will be used to evaluate the student's performance in this course.

Credit

In the fall, students receive a grade of INP (in progress). In the winter, a grade is recorded on the transcript. A grade of SAT is based on completion of the following:

1. Teaching Philosophy Statements and Reflective Report
2. Reflective Learning Journal and Reflective Report
3. 2nd Semester Session Planning/Implementation and Report
4. Self-Directed Assignment

VI. University Courses

Courses

University courses are designed for students from different fields and disciplines to engage in course work that is not discipline based.

UNIV*6000 The Structure and Function of Muscle U [0.50]

An interdisciplinary course covering basic aspects of muscle from a range of viewpoints: structure, metabolism, protein content, energetics, mechanics, biological adaptations, growth and development. The course is designed for graduate students from a wide range of specific disciplines and will provide a broad background to muscle biology as well as more detailed insights into specific aspects of each area covered.

UNIV*6010 Regulation in Muscle Metabolism U [0.50]

An interdisciplinary course emphasizing the regulation of muscle metabolism in vivo. The course focuses on the integration of metabolic fuel utilization to meet cellular energy demands under a variety of conditions in the whole animal. Topics include: sources of energy demand, integration of energy supply to meet energy demands, and regulation of cell growth, maintenance and adaptation.

UNIV*6030 Selected Topics in Animal Welfare U [0.50]

This course provides for an interdisciplinary forum for the discussion of topics in animal welfare. Selected topics will be analyzed in depth with input from various disciplines such as animal science, biology, philosophy, psychology, and economics. An introductory lecture for registered students will be followed by six 2-hour seminars which will be open to the university community (advertised through the Centre for the Study of Animal Welfare, CSAW). Proceedings from the course, including papers prepared by registered students, will be published.

UNIV*6500 International Study Option U [0.00]

A period of study in another country as part of a graduate program at the University of Guelph. Details may be obtained from Graduate Program Services.

UNIV*6600 Animal Care Short Course W [0.00]

A one-day seminar covering the following topics: Animal Welfare Philosophy, Ethological Considerations in Animal Management, Assessing Animal Welfare, Ethical Dilemmas, Regulations and Legislation, Euthanasia, Improving Statistical Power, Zoonoses and Biohazards, Recognition and Alleviation of Pain and Distress in Animals, Case Study Evaluation.

UNIV*6710 Commercialization of Innovation F [0.50]

This course is designed to help participants better understand the process, the analytical tools that can assist the process and how best to prepare technologies to survive commercialization. The course includes elements of entrepreneurship, relationship building, organizational change, as well as project and personnel management.

UNIV*6800 University Teaching: Theory and Practice F-W [0.50]

Participants will critically examine aspects of teaching in higher education and develop teaching skills such as lecturing, demonstrating, leading discussions, and problem solving. Satisfactory (SAT) or unsatisfactory (UNS) will be used to evaluate the student's performance in this course.

VII. Fees

University Academic Fees

Tuition Fees

The following schedule of tuition fees will apply.

Schedule of tuition fees per semester

Canadians and Permanent Residents	
Full-time	\$1720.00
Part-time*	\$1152.00
Special (Non-degree) per course	\$ 861.00
International Students	
Full-time	\$2825.00
Part-time*	1883.00
Special (Non-degree) per course	\$1412.00

* The student is obliged to show cause for declaring part-time classification; see Classification. Note that the maximum course credit load for part-time students is 1.0. International students are not permitted to register part-time.

Changes to Fee Assessment

International students who are studying on study permits and whose immigration status changes, or those who may be eligible for the regular tuition fees but are charged the international student tuition rates, must present acceptable official documentation to Graduate Program Services. To effect a change of fees in a particular semester, the documentation must be presented not later than the last working day prior to June 30 (summer semester), November 1 (fall semester), or February 1 (winter semester).

Co-operative Education fee	\$200.00
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Payable by all students in each (academic and work) term of an approved graduate co-op program.

Senior Citizens

Senior citizens, who are Canadian Citizens or Permanent Residents, are aged 65 years and over as of the first day of the month in which a semester commences, and who are admitted for registration, will be exempt from the payment of tuition, student organization and other fees. Course material fees may apply for some courses

Other Academic Fees

Application Fee	\$75.00
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Payable with the submission of an Application for Admission, by bank draft or money order only. This fee also applies to reactivation of a previously closed application file and to requests for deferral of an offer of admission.

Late Registration Fee	\$60.00
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No registration will be permitted after the 14th class day.

Transfer Fee	\$35.00
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Payable with submission of application to transfer degree program and/or department/school designation.

Re-Admission Fee	\$100.00
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Payable with application for re-admission to a graduate program.

Graduation Fee	\$30.00
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Payable in the semester in which requirements are completed.

Thesis Publication Fee	\$50.00
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For the National Library of Canada; payable in the semester in which requirements are completed.

MFA Exhibition Archive Fee	\$50.00
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Payable by MFA graduands in the semester in which requirements are completed.

Internship Fee	\$1,500.00
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Payable by MAN students in each semester.

Studio Fee	\$50.00
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Payable by all Landscape Architecture students in each semester in which they register.

Transcript Fee	per copy, \$8.00
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University Non-Academic Fees

Required only of full-time graduate students, unless otherwise indicated. Full-time students living more than 200 km. from Guelph who apply for "full-time distant" status may be exempted from some of the following fees. See Graduate Program Services for details.

Athletic Fee	\$77.33 per semester
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Payable by all full-time students except non-degree students; the latter and all others must purchase an Athletic card at the Athletics Centre if they wish to use privileges and facilities.

Athletic Capital Fee	\$32.00 per semester
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Payable by all full-time students, except non-degree students

Bus Pass	\$51.43 per semester
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Payable by all full-time and part-time students

Dental Plan	\$112.00 annually
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Special Service Contract: payable by all full-time students except non-degree students. Payable in the Fall semester, (new students pay in their semester of entry) for coverage from September to August. Provincial sales tax is included. Family coverage is available for an additional premium. The Dental Plan has a limited opt-out provision. See the Graduate Students Associate office for details and deadlines for both of these options.

Health Services	\$22.08 per semester
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Payable by all full-time students except non-degree students.

Medical Insurance Premium	\$102.00 annually
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Special Service Contract: payable by all full-time students in either the Fall or Winter semester, depending on the start date; coverage continues until August of each year. Exchange students are charged a semesterly fee of \$51.00. This fee is non-refundable. Provincial sales tax is included. Family coverage is available for an additional premium; apply at the Student Benefits Office within 30 days of the beginning of the semester.

Ontario Public Interest Research Group (Guelph Chapter)

(OPIRG -G)	\$5.50 per semester
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Payable by all full-time and part-time students, except non-degree students. This fee is refundable during the first 3 weeks of each semester to those who do not wish to support its activities. Apply at the OPIRG-G office

Radio Gryphon	\$2.50 per semester
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Payable by all full-time students except non-degree students. This fee is refundable during the first 3 weeks of each semester to those who do not wish to support its activities. Apply at the Radio Gryphon offices.

Student Volunteer Connections	\$1.02 per semester
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Payable by all full-time students, except non-degree students.

Student Support Services:	
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Payable by all full-time students	\$40.76 per semester
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Payable by all part-time students	\$12.23 per semester
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University Centre:	
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(full-time)	\$11.75 per semester
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(part-time)	\$2.34 for each 0.50 course credit
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Payable by all students, except non-degree students. A maximum of \$23.06 is assessed in any fiscal year period (May to April).

Women's Resource Centre	1.65 per semester
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Payable by all full-time students, except non-degree students.

Student Organization Fees

The Constitution of the University of Guelph Graduate Students' Association provides (Art. III, Sec. 1.) for all graduate students of the University of Guelph to be Members of the Association. The following fees are collected as a service to the Association.

Graduate Students' Association Fees (per semester)	
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Membership	\$25.53
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Canadian Federation of Students - Ontario	\$2.08
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Canadian Federation of Students	\$2.49
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Per semester, Bursary Fund	\$1.00
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Payment of Fees

The fees for a semester are due and payable as indicated on the financial statement issued/posted by Student Financial Services for that semester.

Tentative registration may be granted to students who make arrangements with Student Financial Services for the deferred payment of their university accounts. Students who

are expecting to use OSAP funds to pay their semester account are advised to apply for this assistance at least eight weeks in advance of the first day of semester so that the funds will be here by the beginning of the semester. Students wishing a deferral of fees based on anticipated OSAP must receive approval from Student Financial Services.

Please note that Student Financial Services will apply all internal awards against outstanding balances on student's accounts unless prior arrangements have been made.

Account Deferment Fee

If a deferral of fees is granted, the student will be assessed an account deferment fee of \$60.00

Academic Sanction

An academic sanction may be applied to students who have not made payment, or suitable arrangements for payment, of their university accounts. Such sanction may involve one or more of:

1. withholding of semester course standings and reports,
2. withholding of transcripts,
3. withholding of degree or diploma,
4. denial or cancellation of registration for a subsequent semester.

Refund of Fees

Upon the authorization of the dean of Graduate Studies a graduate student who withdraws from the university may be eligible for a refund of part of the fees, to be effective as of the date upon which the withdrawal notice is received in Graduate Program Services. Outstanding Library fines and charges are deducted from the calculated refund.

If the withdrawal results in a credit balance in your fees account, i.e. payments are greater than charges, a refund cheque is produced. Allow approximately four weeks before refunds are available from Student Financial Services. **The University has been directed by the Ministry of Training, Colleges and Universities to return refunds to the National Student Loan Centre in instances where assistance was received through a Government Student Loan.**

Refunds of tuition fees will be calculated according to the effective date and the following schedule.

Class days	Rate
1 - 5 inclusive	100%
6 - 10 inclusive	75%
11 - 15 inclusive	65%
16 - 20 inclusive	50%
21 - 25 inclusive	35%
26 - 30 inclusive	20%
31 and beyond	nil

Refunds of University Non-Academic fees and Student Organization fees (except Bus Pass, medical insurance premium and dental insurance premium) will be made in full up to and including the 15th class day of a semester. No refund of University Non-Academic fees and Student Organization fees will be made after the 15th class day. Room charges will be refunded on a pro rata basis for the period in residence, but cancellation of the residence contract will also result in forfeiture of all or part of the residence deposit. Refer to the Residence Contract Terms and Conditions for further information.

Early Completion Rebate

In certain circumstances, those students who complete the requirements for their degree programs early in a given semester may apply for a partial rebate of tuition fees paid for that semester. The rebate is pro-rated according to the date of final completion (see refund schedule, above). For more information regarding this option, contact Graduate Program Services. In order to qualify for the rebate, the student must have been registered in the immediate preceding semester.

VIII. Graduate Programs

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

Degree Programs listed by College

College of Arts Drama English Fine Art History - Tri-University Program Literary Studies/Theatre Studies in English Philosophy	College of Physical and Engineering Science Chemistry Computing and Information Science Engineering Mathematics and Statistics Physics
College of Biological Science Botany Human Biology and Nutritional Sciences Microbiology Molecular Biology and Genetics Zoology	College of Social and Applied Human Science Economics Family Relations and Applied Nutrition Geography Hospitality and Tourism Management Leadership Consumer Studies Political Science Psychology Sociology and Anthropology
Ontario Agricultural College Agriculture Agricultural Economics and Business Animal and Poultry Science Environmental Biology Food Science Land Resource Science Landscape Architecture Plant Agriculture Rural Extension Studies Rural Planning and Development	Interdepartmental Programs Aquaculture Biophysics Business Studies Food Safety and Quality Assurance International Development Studies Resource and Environmental Economics Rural Studies Toxicology
Ontario Veterinary College Biomedical Sciences Clinical Studies Pathobiology Population Medicine Veterinary Science	

Degree Programs listed by Division

Humanities Drama English Fine Art History - Tri-University Program Literary Studies/Theatre Studies in English Philosophy	Social Sciences Agricultural Economics and Business Consumer Studies Economics Family Relations and Applied Nutrition Geography Hospitality and Tourism Management International Development Studies Landscape Architecture Political Science Psychology Rural Extension Studies Sociology and Anthropology Rural Planning and Development
Human and Animal Sciences Animal and Poultry Science Biomedical Sciences Biophysics Clinical Studies Environmental Biology Family Relations and Applied Nutrition Food Science Food Safety and Quality Assurance Human Biology and Nutritional Sciences Microbiology Molecular Biology and Genetics Pathobiology Population Medicine Psychology Zoology	Plant Sciences Botany Environmental Biology Land Resource Science Microbiology Molecular Biology and Genetics Plant Agriculture

Physical and Engineering Sciences

Biophysics
Chemistry
Computing and Information Science
Engineering
Geography
Land Resource Science
Mathematics and Statistics
Physics

Agricultural Economics and Business

The graduate program in Agricultural Economics and Business 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

Maury Bredahl (204 MacLachlan, Ext. 53532)
mbredahl@uoguelph.ca

Graduate Co-ordinator

Spencer Henson (327 MacLachlan, Ext. 53134)
shenson@uoguelph.ca

Graduate Program Assistant

Bertilla Moroni (311 MacLachlan, Ext. 53915)
bmoroni@uoguelph.ca

Graduate Faculty

M. Rick Bates

BA Guelph, MBA York, CA - Associate Professor

Andreas Boecker

MSc, PhD Kiel - Assistant Professor

Francesco Braga

DOTT. AGR. Catholic Univ. Milan, PhD Guelph - Associate Professor

Maury E. Bredahl

BS, MS North Dakota State, PhD Minnesota - Professor and Chair

John A.L. Cranfield

BSc, MSc Guelph, PhD Purdue - Associate Professor

F. Harry Cummings

BA Western Ontario, MA, PhD Clark - Professor

E. Currie

BA, MBA McMaster, CMA Society of Management Accounting - Assistant Professor

Brady J. Deaton

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

Glenn C. Fox

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

Thomas F. Funk

BS, MS, PhD Purdue - Professor

Getu Hailu

BSc, MSc Alemaya, PhD Alberta - Assistant Professor

Spencer Henson

BSc, PhD Reading - Professor

Karl D. Meilke

BS Washington State, PhD Minnesota - Professor

Craig J. Pearson

BSc Agr Western Australia, MSc Guelph, PhD Macquarie - Dean, Ontario Agricultural College

Wayne C. Pfeiffer

BS, PhD Nebraska - Associate Professor

Donna T. Ramirez

BS Philippines, PhD Illinois - Assistant Professor

Rakhal C. Sarker

BSc, MSc Bangladesh, PhD Guelph - Assistant Professor

David H. Sparling

BSc Queen's, MBA Wilfrid Laurier, PhD McMaster - Associate Professor

Ralph L. Sykes

Associate Diploma Guelph, BA RMC, MBA York, FCA Institute of Chartered Accountants of Ontario - Associate Professor

Francis Tapon

Licence, Des Science Economiques Paris, MBA Columbia, MA, PhD Duke - Professor

Erna van Duren

BA Waterloo, MSc, PhD Guelph - Associate Professor

Alfons J. Weersink

BSc Guelph, MSc Montana State, PhD Cornell - Professor

MSc Program

The MSc program emphasizes the economics of agricultural markets, food business economics and 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 agriculture, food and related fields. 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.

Feb. 17, 2006

Admission Requirements

The minimum requirement is an honours baccalaureate with a minimum B- standing. All students entering the MSc program in agricultural economics will have already taken, or be expected to take at the initiation of the program, the following basic courses:

1. Intermediate level micro- and macro-economic theory (ECON*2310 and ECON*2410, or equivalent).
2. Calculus and matrix algebra with applications to economics (ECON*2770, or equivalent).
3. Intermediate level statistics (ECON*3740, or equivalent).

These make-up courses, if needed, do not carry graduate credit and, in some instances, may be supplemented with other undergraduate courses at the discretion of the Graduate Advisory Committee.

Degree Requirements

The MSc program consists of a set of core courses plus other courses of the student's choice in the areas of concentration and supporting fields. Graduate students are expected to select the courses they want to pursue before the beginning of their second semester. In addition to course work requirements, the student must prepare a thesis on a topic approved by his/her advisory committee. With an appropriate undergraduate background, a student should be able to complete the MSc program with thesis in five or six full-time semesters (18 to 24 months).

The minimum course work requirements (assuming all undergraduate background requirements have been met) are:

1. Microeconomic Theory (ECON*3710 or ECON*6000) and Macroeconomic Theory (ECON*4810 or ECON*6020);
2. one graduate course in quantitative methods selected from AGE*6360, ECON*6050, or COST*6060;
3. two graduate courses in agricultural economics;
4. one additional graduate course; and
5. a seminar course (AGE*6800).

Students interested in emphasizing one of the three fields emphasized by the Master's program are advised to take the following courses:

Economics of Agricultural Markets:

- Microeconomic Theory (ECON*3710 or ECON*6000)
- Macroeconomic Theory (ECON*4810 or ECON*6020)
- One of the three graduate course in quantitative methods selected from:
 - Mathematical Programming (AGE*6360)
 - Econometrics (ECON*6050 or ECON*6140)
 - Multivariate Statistics (COST*6060)
- Two graduate courses in agricultural economics
- One additional graduate course
- One-credit seminar course (AGE*6800)

Natural Resource and Environmental Economics:

- Microeconomic Theory (ECON*3710 or ECON*6000)
- Macroeconomic Theory (ECON*4810 or ECON*6020)
- One of the three graduate course in quantitative methods selected from:
 - Mathematical Programming (AGE*6360)
 - Econometrics (ECON*6050 or ECON*6140)
 - Multivariate Statistics (COST*6060)
- Renewable Resource Economics (AGE*6610)
- Cost-Benefit Analysis (AGE*6320)
- Environmental Economics (ECON*6800)
- One of the following:
 - One-credit seminar course (AGE*6800)

Food Business Economics:

- Microeconomic Theory (ECON*3710 or ECON*6000)
- Macroeconomic Theory (ECON*4810 or ECON*6020)
- One of the three graduate course in quantitative methods selected from:
 - Mathematical Programming (AGE*6360)
 - Econometrics (ECON*6050 or ECON*6140)
 - Multivariate Statistics (COST*6060)
- Three of the following:
 - Marketing Management (AGE*6110)
 - Business Policy (AGE*6140)
 - Agricultural Policy (AGE*6220)
 - Agricultural Trade Policy (AGE*6240)
 - Operations Management (AGE*6410)
 - Advanced Agricultural Marketing Analysis (AGE*6570)

- Advanced Price Analysis (AGEC*6540)

One-credit seminar course (AGEC*6800)

Note that students electing to take certain courses that are offered to MBA students in the department may be required to successfully complete more than six taught courses.

PhD Program

The PhD program in agricultural economics focuses on three major areas of emphasis:

- Economics of agricultural markets
- Food business economics
- Resource and environmental economics

Across these areas there is a focus on both developed and developing countries. Students in the PhD program must choose an area of specialization relevant to their thesis research, plus complete courses in economic theory and economic research methods. All students must complete and defend a thesis in their chosen area of specialization.

Admission Requirements

Students are admitted to the PhD program in the Fall of each year. Students entering the PhD program are expected to have satisfied the requirements, or their equivalents, of the department's MSc degree in Agricultural Economics (or will be required to make up any deficiencies before admission to the PhD program). 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 Agricultural Economics Graduate Studies 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

The student is expected to demonstrate competence in a major field of specialization (see below). Six graduate courses or their equivalents related to this field are normally required. Further, a student must successfully complete a program of study in microeconomic theory, consisting of two graduate level courses, plus three courses in economic research methods. Although a total of 11 courses is a recommended minimum, students able to demonstrate satisfactory level of competence in any of these requirements may have these course requirements adjusted accordingly.

All students must complete the following microeconomic theory and economic research methods courses:

Microeconomic Theory:

ECON*6000	Microeconomic Theory I
ECON*6010	Microeconomic Theory II

Economic Research Methods:

AGEC*6360	Mathematical Programming
AGEC*6100	The Methodology of Economics
Plus ONE of:	
ECON*6050	Introduction to Econometric Methods
ECON*6140	Econometrics I
COST*6060	Multivariate Research Methods

Specialized Field of Study:

In addition, students must complete the following courses related to their chosen area of specialization:

AGEC*6400	Advanced Topics in Agricultural Economics
Plus FIVE from:	
AGEC*6420	The Economics of the Firm: Concepts with Applications
AGEC*6020	Economics of Food Safety and Quality
AGEC*6540	Advanced Price Analysis
AGEC*6570	Advanced Agricultural Marketing Analysis
ECON*6700	Industrial and Market Organization
AGEC*6250	Futures and Options
AGEC*6240	Agricultural Trade Policy
AGEC*6220	Agricultural Policy
ECON*6300	International Trade Theory
AGEC*6610	Economics of Renewable Resources
ECON*6800	Environmental Economics
ECON*6020	Macroeconomics I
ECON*6350	Economic Development
AGEC*6600	Agriculture in Economic Development
AGEC*6320	Cost Benefit Analysis
AGEC*6700	Advanced Resource Economics

Any other course approved by the Department Graduate Advisory Committee.

Students are required to complete their course work by the end of the fourth semester.

The required courses will prepare the student for the qualifying examination. The first element of the qualifying examination covers microeconomics theory, which is taken after the second semester. The second element examines competence in agricultural economics as a whole and the chosen field of specialization. The third element consists of an oral defence of a thesis proposal. The second and third elements are taken at the end of the

fourth semester. Qualification must be completed by the end of the fifth semester at the very latest. Upon satisfactory completion of the qualifying examinations the student becomes a candidate for the PhD degree.

Interdepartmental Programs

Business Studies MBA Program

The Department of Agricultural Economics and Business participates in the MBA program in the field of agribusiness management. Those faculty members whose research and teaching expertise includes aspects of business administration offer core courses for MBA students. Please consult the Business Studies listing for a detailed description of the MBA program.

International Development Studies Collaborative MA/MSc Program

The Department of Agricultural Economics and Business participates in the MA/MSc program in Collaborative International Development Studies (CIDS). Please consult the Collaborative International Development Studies listing for a detailed description of the MA/MSc collaborative program including the special additional requirements for each of the participating departments.

Resource and Environmental Economics PhD Program

The department shares with the Department of Economics a PhD program in resource and environmental economics. The normal basis for admission to this program is a recognized master's degree in economics or agricultural economics with high academic standing. All students must complete required course work; pass qualifying examinations in three fields (economic theory, and two of the fields listed above); and submit and defend an acceptable thesis. This program is described in detail under Resource and Environmental Economics.

Courses

Production Economics

AGEC*6020 Economics of Food Safety and Quality U [0.50]

The overall aim of the course is to explore economic aspects of food safety and quality and the ways in which economics can aid understanding of food safety and quality issues.

Prerequisite(s): ECON*3710 or ECON*6000.

AGEC*6360 Mathematical Programming F [0.50]

A study of the algebra, assumptions and economic logic of important optimizing techniques and their application to problems in quantitative economics.

AGEC*6420 The Economic of the Firm: Concepts and Applications F [0.50]

This course examines the traditional production economics literature on production functions, cost functions and profit functions as those relationships are used in applied economics analysis. The theory behind the certainty equivalent profit model and its application to decision making under risk is introduced. Optimal capital replacement models used agricultural economics are studied. Finally, selected new developments in the economic theory of the firm are examined.

AGEC*6430 Case Studies in Farm Management U [0.50]

Identification of problems and opportunities on selected representative farms; use of selected management tools for diagnostic analysis and planning; evaluation of relevant management strategies based on the concept of management as a continuous decision-making process.

Agricultural Market Analysis

AGEC*6540 Advanced Price Analysis W [0.50]

The application of microeconomic theory to agricultural commodity modelling, with emphasis on the specification, estimation and interpretation of supply, demand and market equilibrium models.

AGEC*6570 Advanced Agricultural Marketing Analysis S [0.50]

A study of agricultural and food marketing problems with particular emphasis on the application of economic theory and research methods to selected empirical problems.

Prerequisite(s): ECON*3710 or ECON*6000

Agricultural Policy and Trade

AGEC*6220 Agricultural Policy W [0.50]

A critical analysis of contemporary issues in the agricultural policy of affluent economies, with emphasis on Canadian policies.

AGEC*6240 Agricultural Trade F [0.50]

An examination of conceptual and empirical problems, policies, and institutional arrangements in international trade of agricultural products.

AGEC*6600 Agriculture in Economic Development F [0.50]

The course is concerned with the role of agriculture as a source of food, fibre and employment in developing countries. The interaction between agriculture and other sectors of the economy and other countries is also examined.

Prerequisite(s): ECON*1050 and ECON*1100

Natural Resource Economics**AGEC*6320 Cost Benefit Analysis S [0.50]**

A presentation of the theory and methods used in cost benefit analysis. The course will examine selected case studies; and it will include a discussion of both renewable and non-renewable resources.

AGEC*6610 Economics of Renewable Resources F [0.50]

This course is concerned with the optimal use of renewable resources, i.e., resources that exhibit growth or regeneration over a cycle. Models of dynamic allocation are discussed and the role of government in altering the market allocation is considered.

AGEC*6630 Regional Economic Models U [0.50]

Theories and research in regional economics stressing regional development, socio-economic accounting, analysis of structure and growth, economic base and multiplier models.

AGEC*6690 Program Evaluation U [0.50]

An advanced seminar dealing with the theory and practice of program evaluation focusing on public sector programs in agriculture and rural development, international and domestic case studies.

AGEC*6700 Advanced Resource Economics W [0.50]

Seminar on the literature, current research, and methods of analysis in natural resource economics.

Agribusiness Management**AGEC*6070 Research Methods for Managers F [0.50]**

The objective of the course is to provide students with a working knowledge of quantitative and qualitative techniques used in the analysis of management problems. The emphasis is on the application and interpretation of quantitative and qualitative methods rather than on theoretical background.

AGEC*6110 Marketing Research W [0.50]

A study of marketing research analysis in agribusiness firms, with emphasis on the marketing research function and the application of quantitative problem solving techniques.

AGEC*6120 Marketing Management F [0.50]

A study of marketing decision-making in agribusiness firms, with emphasis on the formulation of strategic marketing plans

AGEC*6130 Special Topics in Financial Management U [0.50]

An advanced course for students who wish to explore current and future topics in financial management, trends and problems in financial management, and capital and investment theory related to food and agribusiness firms.

AGEC*6140 Food and Agribusiness Strategic Management U [0.50]

An advanced course requiring the application of conceptual, analytical, problem identification, and problem solving skills to develop organizational strategy. Food, agribusiness and other cases are used to explore the development and implementation of strategy and to assess the dynamic relationship between strategy and competition.

AGEC*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.

AGEC*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): AGEC*6180

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

AGEC*6230 Food and Agribusiness Economics and Policy W [0.50]

An analysis of economic and policy issues relevant for food and agribusiness managers in affluent economies, with emphasis on the economic and policy environment that exists within North America.

AGEC*6250 Futures and Options W [0.50]

The theory and application of futures, options and other derivative securities for marketing, risk management, and investment purposes. Emphasis is placed on application of the instruments to real business situations, and on the development and implementation of trading strategies designed to meet the precise needs of specific business clients.

AGEC*6260 Managing Business Risk U [0.50]

This course is designed to help students recognize, measure and understand different components of business risk. Case studies are used to explore and evaluate risk management alternatives and to implement and monitor risk mitigating strategies. Corporate responsibility in relation to risk management is also addressed.

AGEC*6410 Operations Management I S [0.50]

Overview of the management problems involved in planning, operating and controlling the systems used in operations, with emphasis on farm and agribusiness applications.

AGEC*6750 Problems in Agricultural Business F [0.50]

Seminar course with industry speakers, in preparation to AGEC*6760, and leading to a formal business project proposal.

Other Courses**AGEC*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.

AGEC*6760 Major Project in Food and Agribusiness Management U [0.50]

Management project leading to a referenced technical report on some aspect of food and agribusiness management. Completion of this course requires a formal presentation of the project to faculty and students.

AGEC*6100 The Methodology 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.

AGEC*6720 Readings in Agricultural Economics F,S,W [0.00]

A reading course on selected topics of special interest. May be offered to individual students or to groups of students in any semester.

AGEC*6800 Seminar in Agricultural Economics F,S [0.50]

Students in the MSc and PhD programs must present a department seminar on a topic of the student's choice in agricultural economics. For MSc students the seminar must be presented by the completion of their fourth semester in the program.

Agriculture

The University of Guelph is proud to be a world leader in business education for agriculture. The electronic MBA in Agriculture is a unique program designed to meet the management education needs of agribusiness executives and primary producers around the world. With the electronic method of delivery, we are able to present first class courses to students who are widely dispersed. Our MBA is a specialized program for individuals wishing to pursue and develop opportunities in agribusiness. The program has been developed by both academics and practitioners and is designed to improve the quality of participants' management abilities and practices. Business courses, delivered during segment one of the program, provide the foundation for graduate management education. Upon completion of segment two, students proceed into the University of Guelph's courses designed to deal with business areas of special interest in agriculture.

Administrative Staff

MBA Graduate Programs
Faculty of Management
105 FACS
Guelph, ON
N1G 2W1
Toll free: 1-888-622-2474
Local: 519-824-4120
Fax: 519-836-0661
<http://www.mba.uoguelph.ca>

Interim Associate Dean of the Faculty of Management

Joe Barth (207 MINS, Ext. 54867)
jbarth@uoguelph.ca

Director of Graduate Programs

Ralph Sykes (150 Research Lane, Suite 205, Ext. 56630)
rsykes@uoguelph.ca

Manager of Graduate Programs

Patti Lago (150 Research Lane, Suite 205, Ext. 56607)
plago@uoguelph.ca

Graduate Program Co-ordinator (Distance Program)

Erna van Duren (320 MACS, Ext. 52100)
evandure@uoguelph.ca

Course Production Co-ordinator (Distance Program)

Kim Mitz (105 MINS, Ext. 53415)
kmitz@uoguelph.ca

Graduate Faculty

Rick Bates

BA Guelph, CA Canadian Institute of Chartered Accountants, MBA York - Associate Professor

Francesco Braga

DOTT Agr Milan, PhD Guelph - Associate Professor

George Brinkman

BS, EXM Washington State, PhD Michigan State - Professor

John Cranfield

BSc, MSc Guelph, PhD Purdue - Assistant Professor

Elliot Currie

BA McMaster, CMA Canadian Society of Management Accountants, MBA McMaster - Assistant Professor

Tom Funk

BS, MS, PhD Purdue - Professor

William Moore

BA Guelph, CA Canadian Institute of Chartered Accountants, CMA Canadian Society of Management Accountants, MBA Wilfred Laurier - Assistant Professor

David Sparling

BSc Queens, MBA Wilfred Laurier, PhD McMaster - Associate Professor

Ralph Sykes

Dip Ag Guelph, BA Royal Military College, CA Canadian Institute of Chartered Accountants, FCA Institute of Chartered Accountant of Ontario, MBA York - Associate Professor

Francis Tapon

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

Erna van Duren

BA Waterloo, MSc, PhD Guelph - Associate Professor

MBA Program

Admission Requirements

Admission as a student is granted, on recommendation of the department concerned, to:

1. the holder of an honours baccalaureate (4 year degree) or its equivalent (from a recognized university or college) with an average standing of at least a "B-" (70-72%) in the last four semesters or the last two undergraduate years. At least three years of managerial experience is also required. Or,
2. the holder of:
 - a diploma in agriculture and/or;
 - a diploma in agriculture and/or;
 - an acceptable professional designation; having completed at least five years experience showing progressive increase in responsibility.

The normal academic requirement for admission to the MBA Degree program is a four-year baccalaureate degree and minimum three years of relevant industry experience.

Applicants are also admitted on the basis of prior learning gained through substantial workplace experience. In some cases the admissions committee may ask for a (GMAT) Graduate Management Admissions Test.

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. Students normally complete the MBA in Agribusiness Management in 36 months. Course modules are completed in a pre-determined sequence and are typically two months in length, some variations exist. Students must complete the program within six years of commencement.

The Electronic MBA in Agribusiness Management is completed in two segments:

Core Courses

Requires participants to complete seven core management courses which provide a foundation. Students complete the following courses: Human Resource Management, Financial and Managerial Accounting, Foundations of Leadership, Management Communications, Research Methods, Financial Management and Operations Management.

Specialization Courses

Consists of courses in applied aspects of agricultural business management. Eight courses are required for this phase, or six courses and a major research project.

Major Research Project

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

Computer System Requirements

Students are required to have adequate peripherals to support the learning system, which include CD-ROM capability and a sound card. A basic level of computer literacy is strongly recommended for the MBA program. For information pertaining to computer equipment requirements contact the Faculty of Management office. Students are solely responsible to arrange for the purchase/maintenance of the recommended computer system and software.

Program Fees

Contact the Faculty of Management office for current tuition fee information.

Courses

AGBU*6070 Research Methods for Managers W [0.50]
The objective of the course is to provide students with a working knowledge of quantitative and qualitative techniques used in the analysis of management problems. The emphasis is on the application and interpretation of quantitative and qualitative methods rather than on theoretical background.
<i>Restriction(s):</i> Distance MBA students only.
AGBU*6100 Food and Agribusiness Economics and Policy U [0.50]
An analysis of economic and policy issues relevant for food and agribusiness managers in affluent economies, with emphasis on the economic and policy environment that exists within North America.
<i>Restriction(s):</i> Distance MBA students only.
AGBU*6120 Marketing Management W [0.50]
A study of marketing decision-making in food and agribusiness firms, with emphasis on the formulation of strategic marketing plans.
<i>Restriction(s):</i> Distance MBA students only.
AGBU*6180 Financial and Managerial Accounting U [0.50]
This course emphasizes the gathering and use of financial information to facilitate effective financial and management decisions. Cases are used to approach the subject from the perspective of the user of accounting information rather than that of the supplier.
<i>Restriction(s):</i> Distance MBA students only.

AGBU*6200 Financial Management U [0.50]

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

Prerequisite(s): AGBU*6180 Financial and Managerial Accounting

Restriction(s): Distance MBA students only.

AGBU*6300 Problems in Agribusiness - Summer Residency S [0.50]

A seven-day intensive session, delivered at the University of Guelph, that focuses on the development of a management plan for an agribusiness organization through the use of group case studies, seminars and speakers.

AGBU*6400 Food and Agribusiness Strategic Management U [0.50]

An advanced course requiring the application of conceptual, analytical, problem identification, and problem solving skills to develop organizational strategy. Food, agribusiness and other cases are used to explore the development and implementation of strategy and to assess the dynamic relationship between strategy and competition.

Restriction(s): Distance MBA students only.

AGBU*6510 Managing Price Risk W [0.50]

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

Restriction(s): Distance MBA students only

AGBU*6520 Marketing Research and Analysis F [0.50]

Students will learn the fundamentals of marketing research and analysis as they apply to decision-making. The key focus of the course will be on developing a marketing plan for a real product/service. Input into the marketing plan will come from actual marketing research information collected, analyzed and interpreted by participants. Students will develop and implement background-marketing research that can be used at the conclusion of the course to build the marketing plan. In addition to developing general research skills, special topics such as perceptual mapping for positioning, conjoint analysis for pricing and clustering for segmentation will be examined.

AGBU*6530 Management Issues in Agriculture W [0.50]

This course discusses the application of general management concepts and practices to agricultural production. Topics include strategies farm managers can use to assess performance, set direction, build capabilities and implement change. All readings and cases are taken from the viewpoint of an owner-operator of a commercial farming operation.

AGBU*6610 Dairy Production Management W [0.50]

This course deals with the specifics of applying business management strategies to farm operations. Trends facing the North American dairy industries and challenges faced by individual producers are examined. Relevant and practical operating decision-making and management skills are considered with the intent of maximizing the profitability and reducing the risk of the individual firm.

AGBU*6620 Swine Production Management W [0.25]

This course deals with the specifics of applying business management strategies to farm operations. Trends facing the North American swine industries and challenges faced by individual producers are examined. Relevant and practical operating decision-making and management skills are considered with the intent of maximizing the profitability and reducing the risk of the individual firm.

AGBU*6700 Special Topics in Agribusiness Management U [0.50]

A special topic course focusing on relevant business issues or problems allowing students to enhance and further develop expertise in specific areas of management. May be offered to students in any semester.

AGBU*6800 Directed Research Project U [0.50]

A management research project leading to a referenced report focusing on selected topics of interest in agricultural business.

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, reproductive, or behavioural); and growth and metabolism (meat science). The latter field is offered in collaboration with the Department of Food Science and all fields are enriched through interaction with faculty members from other university departments.

The major expertise of individual faculty is as follows: animal breeding and genetics (Boettcher, Gibbins, Gibson, Jansen, Jiang, Kemp, Lin, Lohuis, Miller, McMillan, Robinson, Schaeffer, Squires, Wilton), animal nutrition (Atkinson, Buchanan-Smith, Burton, Cant, Cho, de Lange, Leeson, McBride, Milligan, Smith, Valdes), animal physiology (Bousquet, Buhr, Duncan, Engelhardt, Etches, Fan, Hacker, Hurnik, King, Moccia, Morrison, Squires, Walton, Widowski), and growth and metabolism (Barbut, Mandell, Swatland).

General Admission Requirements

Research in animal science is enriched by the interaction of scientists from diverse academic disciplines. Accordingly, there are no specific prerequisite courses expected of applicants to the graduate programs in the department. Each applicant will be considered on an individual basis, taking into account the applicant's academic background and relevant experience.

Administrative Staff

Chair

Steve Leeson (146 ANNU, Ext. 53681)
sleeson@uoguelph.ca

Graduate Co-ordinator

Andy Robinson (127 ANNU, Ext. 53679)
andyr@uoguelph.ca

Graduate Secretary

Wendy McGratten (144 ANNU, Ext. 56215)
wmcgratt@uoguelph.ca

Graduate Faculty

*Please see the Department's webpage at www.aps.uoguelph.ca for a complete listing of faculty.

James L. Atkinson

BSc UMIIST, Manchester, MSc London, PhD Guelph - Associate Professor

Shai Barbut

BS Hebrew University of Jerusalem, MS, PhD Wisconsin (Madison) - Professor

Gregory Bedecarrats

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

Mary M. Buhr

BSc, MSc, PhD Waterloo - Professor

Dominique P. Bureau

BASc, MSc Laval, PhD Guelph - Assistant Professor

John H. Burton

BSA Toronto, MS, PhD Cornell - Professor

John P. Cant

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

Cornelius F.M. de Lange

BSc, MSc Wageningen, PhD Alberta - Associate Professor

Ian J.H. Duncan

BSc (Agr), PhD Edinburgh - Professor

Ming Z. Fan

BS Xinjiang, MS Harbin, PhD Alberta - Associate Professor

James France

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

Ann M. Gibbins

BSc Birmingham, MSc, PhD Guelph - Professor

Serguei P. Golovan

BSc St. Petersburg State, PhD Guelph - Assistant Professor

Roger R. Hacker

BS Wisconsin, MS Missouri, PhD Purdue - Professor

Gerald B. Jansen

BSc (Agr), PhD Guelph - Assistant Professor

Niel A. Karrow

BSc Guelph, MSc, PhD Waterloo - Assistant Professor

Steven Leeson

MPhil, PhD Nottingham - Professor

Julang Li

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

Ira B. Mandell

BS, MS Ohio State, PhD Saskatchewan - Assistant Professor

Georgia Mason

BA, PhD Cambridge - Associate Professor

Brian W. McBride

BSc, MSc Guelph, PhD Alberta - Professor

Ian McMillan

BSc, MSc, PhD Toronto - Professor

Stephen P. Miller

BSc (Agr), PhD Guelph - Associate Professor

Larry P. Milligan

BSc, MSc Alberta, PhD California (Davis), FRSC - Professor

Richard D. Moccia

BSc, MSc Guelph - Associate Professor

Vern R. Osborne

BSc, MSc, PhD Guelph - Assistant Professor

J. Andrew B. Robinson

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

Larry R. Schaeffer

BS Purdue, MS, PhD Cornell - Professor

Trevor K. Smith

BSc British Columbia, MSc Manitoba, PhD Cornell - Professor

E. James Squires

BSc, MSc, PhD Memorial - Professor

Kendall C. Swanson

BS, MS North Dakota State, PhD Kentucky - Assistant Professor

Howard J. Swatland

BSc London, MSc, PhD Wisconsin - Professor

John S. Walton

BSc, PhD Reading - Professor

Tina M. Widowski

BS, MS, PhD Illinois - Associate Professor

James W. Wilton

BSA Manitoba, MSc Toronto, PhD Cornell - Professor

MSc Program

The MSc program involves advanced courses and the completion of a research project. These are means of developing the skills and intellectual curiosity that may further qualify the student for a leadership role within the animal industry 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 two areas of specialization: animal breeding & genetics and animal nutrition & metabolism.

Admission Requirements

An honours baccalaureate, with a minimum average grade of 'B' during the last four semesters of study, will normally be required.

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 departmental 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, one of which will be ANSC*6900, Major Paper in Animal and Poultry Science, 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 two areas of specialization

are as follows: Animal Breeding & Genetics (ANSC*6900, ANSC*6210, ANSC*6240, ANSC*6370, ANSC*6380, ANSC*6390, ANSC*6450); Animal Nutrition & Metabolism (ANSC*6900, ANSC*6010, ANSC*6020, ANSC*6030, ANSC*6250, ANSC*6260, ANSC*6360, ANSC*6450).

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 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.

Interdepartmental Programs

MSc (Aquaculture) Interdepartmental Program

The Department of Animal and Poultry Science participates in the master of science in aquaculture program. Professors Atkinson, Cho, McMillan and Moccia are members of the Aquaculture Interdepartmental Group. These faculty members' expertise includes aspects of aquaculture; they may serve as advisors for MSc (Aquaculture) students. Please consult the Aquaculture listing for a detailed description of the MSc (Aquaculture) interdepartmental program.

Toxicology MSc/PhD Collaborative Program

The Department of Animal and Poultry Science participates in the MSc/PhD program in toxicology. Professor Karrow, Smith, and Squires are members of the Toxicology Interdepartmental Group. 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. Toxicology MSc, PhD

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 Quantitative Genetics and Animal Breeding F [0.50]

Current literature and classical papers pertaining to quantitative genetics and breeding are reviewed in detail.

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*6380 Estimation of Genetic Parameters W [0.50]

The course covers Bayesian approaches to analysis of data; categorical data analysis; accounting for selection bias; major gene analyses; models for handling marker genes; and recent developments in statistical methodology related to animal breeding applications.

ANSC*6390 QTL's and Markers (offered all years pending demand) W [0.50]

Advanced training in the mathematical aspects of quantitative genetic theory as applied to animal breeding.

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.

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*6260 Digestion and Metabolism in the Ruminant (even years only) W [0.50]

A review of current research on rumen function, post-ruminal digestion and host tissue metabolism, integrating fundamental principles so as to formulate models of nutrient utilization. The course consists of assigned readings, lectures and tutorial

ANSC*6360 Techniques in Animal Nutrition Research (even years only) F [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.

Animal Physiology

ANSC*6400 Mammalian Reproduction (odd years only) F [0.50]

Discussions and applications of methodology for collection and examination of gametes and embryos and for measurements of hormones in biological fluids.

ANSC*6440 Advanced Concepts and Methods in Applied Ethology W [0.50]

An in-depth review of classic papers and current topics in applied ethology. Discussions will include applications of methodologies and analyses used to conduct 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.

Growth and Metabolism

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.

General

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.

Aquaculture

The university offers an interdepartmental program of study leading to the degree of master of science in aquaculture [MSc (Aquaculture)]. The participating units are the Departments of Agricultural Economics and Business, Animal and Poultry Science, Biomedical Sciences, Food Science, Human Health and Nutritional Sciences, Integrative Biology, Marketing and Consumer Studies, Molecular and Cellular Biology, Pathobiology, Philosophy, and Population Medicine.

Administrative Staff

Chair and Graduate Co-ordinator

Richard D. Moccia (135 Animal & Poultry Science, Ext. 56216)
rmoccia@uoguelph.ca

Graduate Faculty

James L. Atkinson

Associate Professor, Animal and Poultry Science

James S. Ballantyne

Associate Professor, Integrative Biology

Dominique Bureau

Assistant Professor, Animal and Poultry Science

David Castle

Assistant Professor, Philosophy

Moirra M. Ferguson

Professor and Chair, Integrative Biology

Thomas F. Funk

Professor, Agricultural Economics and Business

John F. Leatherland

Professor, Biomedical Sciences

John Lumsden

Associate Professor, Pathobiology

Ian McMillan

Professor, Animal and Poultry Science

Richard D. Moccia

Associate Professor, Animal and Poultry Science

Wayne C. Pfeiffer

Associate Professor, Agricultural Economics and Business

Rosalynn M.W. Stevenson

Associate Professor, Molecular and Cellular Biology

Margaret Thorburn

Assistant Professor, Population Medicine

Glen J. Van Der Kraak

Professor, Integrative Biology and Associate Dean, Research, CBS

Patricia A. Wright

Professor, Integrative Biology

Rickey Y. Yada

Professor, Food Science

MSc Program

Aquaculture is the production of biomass of any aquatic plant or animal, including algae, molluscan, crustacean, and fish species, through artificial cultivation techniques. The MSc (Aquaculture) program is a non-thesis degree option consisting of courses and a special project related primarily to the production of cool water and cold water fin-fish species. The objective of the degree is to provide an intensive, multidisciplinary program of study, without areas of sub-specialization. Graduates will obtain an integrated, technical knowledge of the concepts of animal production, agribusiness and state-of-the-art technology as they relate to aquaculture. The program includes a wide range of courses, a special project requirement and a practicum intended to provide essential experience in applied fish-production systems.

Admission Requirements

Students may be admitted to the MSc (Aquaculture) program from a variety of undergraduate backgrounds, including honours degree programs in animal or agricultural science, environmental biology, fisheries biology, marine biology, microbiology, nutritional sciences, wildlife biology, and zoology. The adequacy of a student's background and experience will be assessed by an admissions committee before a student is permitted to enter the program. All applicants must meet the university minimum criteria for admission to graduate studies. In addition, the admissions committee will look for relevant work experience or recognized educational training in agrifood systems and aquatic or fisheries science.

Applications must be accompanied by a letter of intent expressing the student's reasons for wanting to enter the program. Prior completion of introductory basic science courses will be expected.

Degree Requirements

The program requires the completion of a minimum of 6.5 course credits. Students will be permitted to take additional, elective course credits if desired. At least 4.5 of the course credits will be at the graduate level and all undergraduate courses must be eligible for graduate credit. The selection of the courses will be dependent, in part, on the courses completed in the student's undergraduate program. The total duration of the program is expected to be 3-4 full-time semesters, or longer if part-time study is undertaken. Detailed schedules of studies are available from the program coordinator or from any member of the graduate faculty in the program. The student's advisor will provide leadership in making arrangements for, and providing advice on, the student's overall program, including the special project. Students in the program will be under the guidance of the Aquaculture Interdepartmental Group, and will register both in the interdepartmental program and in the department of their advisor. The Aquaculture Interdepartmental Group consists of members of the graduate faculty whose teaching or research interests are wholly or partly related to aquaculture.

Courses

AQUA*6000 Special Project in Aquaculture F,S,W [1.00]

An intensive learning opportunity focusing on an applied problem in the aquaculture industry. Completion of a literature review and project, in concert with hands-on experience with live animals, either in a research or commercial setting, form the basis of a final report and oral presentation to be made to a committee of core program faculty. Practical experience is also gained through on-site training at the Alma Aquaculture Research Station.

AQUA*6100 Science and Technology in Aquaculture F [0.50]

A formal lecture, student seminar and essay course designed to examine the role of science and technology in the aquaculture industry. Latest advances in the scientific community are explored, with special attention to those developments having promise for commercialization and technology transfer to the private sector. The course will explore the relationships between basic and applied science, and the development of new technology for the industry.

AQUA*6200 Practicum in Aquaculture: Culture of Salmonids S [0.50]

Using a problem-solving approach, students will complete a series of models at the Alma Aquaculture Research Station covering topics in water management, hatchery operations, propagation techniques, feeding and nutrition, health and disease, economics and regulatory issues. Students will solve practical problems from both a theoretical and applied perspective.

Graduate Courses Eligible for credit in the MSc (Aquaculture) program:

Agricultural Economics and Business

AGEC*6120	0.5	Marketing Management
AGEC*6130	0.5	Topics in Financial Management
AGEC*6430	0.5	Case Studies in Farm Management

Animal and Poultry Science

ANSC*2200	0.5	Principles of Aquaculture
ANSC*6450	0.5	Topics in Animal Biotechnology

Economics

ECON*6750	0.5	Managerial Economics
ECON*6770	0.5	Financial Management

Food Safety and Quality Assurance

FSQA*6600	0.5	Principles of Food Safety and Quality Assurance
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Geography

GEOG*6281	0.5	Environmental Resource Evaluation
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Hospitality and Tourism Management

HTM*6110	0.5	Foundations of Management Leadership
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Marketing and Consumer Studies

COST*6010	0.5	Product Development and Management Systems
COST*6150	0.5	Quality Assurance Management

Rural Extension Studies

REXT*6190	0.5	Fundamentals of Interpersonal and Intercultural Communication
REXT*6311	0.5	Extension Theory and Methods

Rural Planning and Development

RPD*6310	0.5	Environmental Impact Assessment
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Integrative Biology

ZOO*6550	0.5	Aquaculture
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Undergraduate Courses Eligible for Graduate Credit

(Students must not have received credit for these courses as part of their undergraduate programs):

Agricultural Economics and Business

AGEC*4220	0.5	Advanced Farm Management
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Animal and Poultry Science

ANSC*3120	0.5	Introduction to Animal Nutrition
ANSC*3150	0.5	Principles of Farm Animal Care and Welfare
ANSC*4050	0.5	Recombinant DNA in Animal Science
NUTR*3340	0.5	Nutrition of Fish and Crustacea

Biology

BIOL*3450	0.5	Introduction to Aquatic Environments
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Environmental Sciences

ENVB*3360	0.5	Waste Management and Utilization
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Food Science

FOOD*4700	0.5	Food Product Development
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Marketing and Consumer Studies

COST*3010	0.5	Quality Management
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Pathobiology

PATH*3610	0.5	Principles of Disease
PATH*4100	0.5	Diseases of Aquatic Animals

Integrative Biology

ZOO*4110	0.5	Principles of Fish and Wildlife Management
ZOO*4020	0.5	Ichthyology
ZOO*4330	0.5	Environmental Biology of Fishes
ZOO*4350	0.5	Biology of Polluted Waters
ZOO*4390	0.5	Environmental Physiology

Note

Other relevant graduate and undergraduate courses may be taken for credit subject to the approval of the student's advisory committee.

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 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 (DVM) program, co-ordinated by an interdepartmental committee chaired by the assistant 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 Co-ordinator (in-progress students)

Ann Hahnel (3642 OVC, Ext. 58399)
ahahnel@ovc.uoguelph.ca

Graduate Co-ordinator (new students and scholarships)

Gordon Kirby (2624 OVC, Ext. 54948)
gkirby@uoguelph.ca

Graduate Secretary

Wendy Arthur (2633 OVC, Ext. 54900)
warthur@ovc.uoguelph.ca

Graduate Faculty

Carol L. Armstrong

BSc Calgary, MSc Dalhousie, PhD Calgary - Assistant Professor

Pawel M. Bartlewski

DVM Poland and UK, MSc, PhD Saskatchewan - Assistant Professor

Dean H. Betts

BSc, MSc Western Ontario, PhD Guelph - Assistant Professor

Herman J. Boermans

DVM, MSc, PhD Guelph - Associate Professor

Peter D. Conlon

BSc (Agr), MSc McGill, DVM, PhD Guelph - Associate Professor

Brenda L. Coomber

BSc, MSc Guelph, PhD Toronto - Associate Professor

W. Larry Grovum

BSA Saskatchewan, PhD New England - Professor

Ann C. Hahnel

BA, BSc, PhD Washington - Associate Professor

W.J. Brad Hanna

BSc, DVM, MSc, PhD Guelph - Assistant Professor

Ronald Johnson

BSc, DVM Guelph, PhD Michigan State - Associate Professor

Bettina E. Kalisch

BSc, MSc, PhD Queen's - Associate Professor

W. Allan King

BSc, MSc Guelph, PhD Uppsala - Professor

Gordon Kirby

DVM Guelph, MSc Surrey, PhD Guelph - Associate Professor

Jonathan LaMarre

DVM, PhD Guelph - Associate Professor

John F. Leatherland

BSc Sheffield, PhD Leeds, DSc Sheffield - Professor

Neil J. MacLusky

BSc Leeds, PhD London - Professor and Chair

Roger A. Moorehead

BSc, PhD McMaster - Assistant Professor

Gary D. Partlow

BSc Guelph, MSc Western Ontario, PhD Ottawa - Associate Professor

James J. Petrik

BA, MA, PhD Western Ontario - Assistant Professor

W. Glen Pyle

BSc Guelph, PhD Tennessee - Assistant Professor

Ioana M. Sonea

BSc College Marie de France (Montreal), DVM Montreal, PhD Michigan State - Associate Professor

Alastair J.S. Summerlee

BSc, BVSc, PhD Bristol, MRCVS - University President

Jeffrey J. Thomason

BA Cambridge, MSc, PhD Toronto - Professor

Shigeto Yamashiro

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

MSc Program

Students may take an MSc degree in Reproductive Biology, Developmental, Cell and Tissue Morphology, and Biomedical Toxicology/Pharmacology. The thesis 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 of the applicant's professors 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 spring semester. Students who do not meet this 'B+' standard may be admitted into a provisional category 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 category will normally be recommended when the student obtains a minimum 'B+' in two courses that have been approved by the department's graduate program committee in consultation with the student's advisory committee 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 1.5 credits. The student must also prepare and defend an acceptable thesis. Prescribed and additional courses are selected by the student in consultation with the student's advisory committee. The courses selected will depend on the student's prior experience and the nature of the research project. 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 advisory 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 oriented 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 the potential for independent, productive and original research. Admission to the PhD program generally requires completion of a research-based MSc program, 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 spring 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. The element of critical thinking is expected and it is fostered through appraisal of the literature of the student's research field, presentation of three departmental seminars during the program, and interaction with graduate faculty and visiting senior scientists. All students are required to present three departmental seminars during their program.

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. However, the student's advisory committee may require the student to successfully complete specified graduate courses before she

or he undertakes the qualifying examination. The qualifying examination, which includes written and oral components, must be completed before the end of the third semester of the PhD program, or before the end of the fifth semester for those students who transfer directly from the MSc program. 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.

Interdepartmental Programs

Biophysics MSc/PhD Collaborative Program

The Department of Biomedical Sciences participates in the MSc/PhD program in biophysics. Professor Thomason is a member of this group. He may serve as an advisor for MSc and PhD students. Please consult the Biophysics listing for a detailed description of the MSc/PhD collaborative program.

Toxicology MSc/PhD Collaborative Program

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.

DVSc Program

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

Courses

BIOM*6060 Functional Neuroanatomy U [0.50]

A course emphasizing the structure and function of the mammalian nervous system and organs of special sense.

BIOM*6070 Pregnancy, Birth and Perinatal Adaptations U [0.50]

A multidisciplinary seminar course to promote understanding of physiological processes occurring during mammalian pregnancy, from implantation to the perinatal period. Regulation of homeostasis and growth as well as both maternal and fetal factors that contribute to suboptimal gestational outcomes are covered.

BIOM*6110 Advanced Microscopy for Biomedical Sciences U [0.50]

Routine and specialized procedures for light microscopy, and transmission and scanning electron microscopy are examined through lectures, discussions and practical exercises. Interpretation of micrographs is included.

BIOM*6130 Vertebrate Developmental Biology U [0.50]

The principles of vertebrate development are examined through lectures, discussions and practical exercises. Topics include aspects of gametogenesis, fertilization, implantation, embryonic and fetal development and experimental manipulation of embryos. Emphasis is on mammalian development and topics may vary depending on student needs and interests.

BIOM*6160 Cellular Biology U [0.50]

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

BIOM*6190 Tissue Culture Techniques in Biomedical Sciences U [0.50]

An introduction to in vitro techniques examining aspects and principles of the culture environment, isolation methods, propagation, characterization and storage of cultured cells, gametes and embryos. Practical exercises and student assignments complement material presented in lecture and seminar format.

BIOM*6440 Biomedical Toxicology U [0.50]

The course examines chemical compounds injurious to animals and man, toxicity testing, teratogens, carcinogens, factors influencing toxicity, and toxic drug interactions. The mechanism of action, metabolism, and principles of antidotal treatment are also studied.

BIOM*6480 Pharmacodynamics and Pharmacokinetics U [0.50]

This course describes drug absorption, distribution, biotransformation and elimination in animals and human beings, and emphasizes factors which modify drug behaviour. It integrates molecular mechanisms with physiological processes and highlights the importance of receptors and second messengers in cellular responses to pharmacologic agents.

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

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

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

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

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

See BIOM*6601 above.

BIOM*6610 Vascular Biology U [0.50]

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

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

Permits further in depth study of developmental and morphological sciences.

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

See BIOM*6701 above.

BIOM*6711 Special Topics in Physiology & Biochemistry U [0.25]

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

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

See BIOM*6711 above.

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

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

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

See BIOM*6721 above.

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 Co-ordinator

Frances J. Sharom (Molecular and Cellular Biology, Ext. 52247)
fsharom@uoguelph.ca

Graduate Faculty

Christopher T. Bauch

Assistant Professor, Mathematics and Statistics

Terry Beveridge

Professor, Molecular and Cellular Biology

Manfred Brauer

Associate Professor, Molecular and Cellular Biology

Leonid Brown

Assistant Professor, Physics

David Chiu

Professor, Computing and Information Science

Marc Coppolino

Assistant Professor, Molecular and Cellular Biology

James H. Davis

Professor, Physics

John Dawson

Assistant Professor, Molecular and Cellular Biology

James Dickey

Assistant Professor, Human Health and Nutritional Sciences

John R. Dutcher

Professor, Physics

Hermann Eberl

Assistant Professor, Mathematics and Statistics

Douglas Fudge

Assistant Professor, Integrative Biology

Todd Gillis

Assistant Professor, Integrative Biology

Saul Goldman

Professor Emeritus, Chemistry

Christopher G. Gray

Professor Emeritus, Physics

George Harauz

Professor, Molecular and Cellular Biology

Mark Hurtig

Professor, Clinical Studies

Kenneth R. Jeffrey

Professor Emeritus, Physics

Robert A.B. Keates

Associate Professor, Molecular and Cellular Biology

Matthew S. Kimber

Assistant Professor, Molecular and Cellular Biology

Stefan W. Kycia

Assistant Professor, Physics

Vladimir Ladizhansky

Assistant Professor, Physics

Bill Langford

Professor Emeritus, Mathematics and Statistics

Anna T. Lawniczak

Professor, Mathematics and Statistics

Michael I. Lindinger

Associate Professor, Human Health and Nutritional Sciences

Dev Mangroo

Assistant Professor, Molecular and Cellular Biology

A. Rodney Merrill

Professor, Molecular and Cellular Biology

Michele Oliver

Assistant Professor, Engineering

K. Peter Pauls

2004-2006 University of Guelph Graduate Calendar

Professor, Plant Agriculture

Peter Purslow

Professor, Food Science

Glen Pyle

Assistant Professor, Biomedical Sciences

Frances J. Sharom

Professor, Molecular and Cellular Biology

E. Donald Stevens

Professor, Integrative Biology

Jeffrey J. Thomason

Professor, Biomedical Sciences

Bruno Tomberli

Research Associate, Physics

Jack T. Trevors

Professor, Environmental Biology

Christopher Whitfield

Professor, Molecular and Cellular Biology

Alan Willms

Assistant Professor, Mathematics and Statistics

Janet M. Wood

Professor, Molecular and Cellular Biology

Rickey Y. Yada

Professor, Food Science

Simon Yang

Associate Professor, Engineering

Graduate Faculty from Brock University

Alan Bown

Professor, Biological Sciences

Douglas Bruce

Professor, Biological Sciences

A. Joffre Mercier

Professor, Biological Sciences

Sandra Peters

Assistant Professor, Physical Education and Kinesiology

Edward Sternin

Associate Professor, Physics

Graduate Faculty from the University of Toronto

William McIlroy

Associate Professor, Physical Therapy

Graduate Faculty from McMaster University

Richard Epanand

Professor, Biomedical Sciences

Graduate Faculty from Wilfrid Laurier University

Ross E. Cressman

Professor, Mathematics

Masoud Jelokhani-Niaraki

Assistant Professor, Chemistry

Additional Members of the Program

John Katsaras

National Research Council of Canada, Chalk River ON

Martine Monette

Bruker Canada, Milton ON

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. 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. A total of 1.0 graduate course credits are required, one of which is usually BIOP*6000. The advisory committee may require additional courses for any student. An average of 70% (B-) or better must be obtained in the prescribed courses. As early as feasible, but no later than the final semester of the minimum duration, a PhD student is required to complete a qualifying examination to assess her or his knowledge of the subject. This examination should normally be taken within the first five semesters of registration as a PhD student. When the qualifying examination and the course work are satisfactorily completed, the submission and successful defense of an acceptable thesis on an approved topic completes the requirements for the PhD in Biophysics.

Courses

BIOP*6000 Concepts in Biophysics W [0.50]

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

BIOP*6010 Biophysics Seminar U [0.00]

Public seminar presented by all PhD students in the Biophysics program. This seminar is to be presented within four semesters from entry to the program. The course is optional for MSc students.

Prerequisite(s): Prerequisite BIOP*6000.

BIOP*6950 Advanced Topics in Biophysics U [0.50]

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

PHYS*7510 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 Selected Topics in Experimental Biophysics U [0.50]

Offered on demand

PHYS*7570 Special Topics in Biophysics U [0.50]

Offered on demand

Courses in Related Subjects:

Biomedical Sciences

BIOM*6110	0.5	Advanced Microscopy for Biomedical Sciences
BIOM*6160	0.5	Cellular Biology
BIOM*6190	0.5	Tissue Culture Techniques in Biomedical Sciences

Chemistry

CHEM*7300	0.5	Proteins and Nucleic Acids
CHEM*7360	0.5	Regulation in Biological Systems
CHEM*7370	0.5	Enzymes
CHEM*7380	0.5	Cell Membranes and Cell Surfaces
CHEM*7310-7330	0.5	Selected Topics in Biochemistry

Computing and Information Science

CIS*6040	0.5	Advanced Image Analysis
CIS*6050	0.5	Advanced Neural Networks: Dynamical Recurrent Networks
CIS*6060	0.5	Bioinformatics
CIS*6080	0.5	Genetic Algorithms

CIS*6420	0.5	Artificial Neural Networks
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Engineering

ENGG*6070	0.5	Medical Imaging
ENGG*6130	0.5	Physical Properties of Biomaterials
ENGG*6150	0.5	Bioinstrumentation
ENGG*6560	0.5	Advanced Digital Signal Processing

Human Biology and Nutritional Sciences

HBNS*6020	0.05	Biodynamics
HBNS*6030	0.05	Applied Ergonomics
HBNS*6130	0.05	Advanced Skeletal and Muscle Metabolism in Humans
HBNS*6700	0.05	Nutrition Exercise and Metabolism

Mathematics and Statistics

MATH*6051	0.5	Mathematical Modelling
MATH*6071	0.5	Biomathematics
STAT*6761	0.5	Survival Analysis
STAT*6850	0.5	Advanced Biometry
STAT*6950	0.5	Statistical Methods for the Life Sciences
STAT*6960	0.5	Design of Experiments and Data Analysis for the Life Sciences

Microbiology

MICR*6040	0.5	Advanced Microbial Physiology
MICR*6070	0.5	Bacterial Structures and Virulence
MICR*6423	0.5	Monoclonal Antibodies and Antibody Engineering
MICR*6500	0.5	Microbial Genetics

Molecular and Cellular Biology

MBG*6020	0.5	Topics in Molecular Biology and Biotechnology
MBG*6050	0.5	Recombinant DNA Technology
MBG*6060	0.5	Topics in Cell Biology and Genetics
MBG*6100	0.5	High Resolution Microscopy for Molecular Biologists

Physics

PHYS*7010	0.5	Quantum Mechanics I
PHYS*7020	0.5	Quantum Mechanics II
PHYS*7040	0.5	Statistical Physics I
PHYS*7050	0.5	Statistical Physics II

Botany

The Botany Graduate Program offers MSc and PhD degrees. The two areas of emphasis and the faculty associated with those areas are:

- Ecology, Evolution and Systematics -- Ackerman, Caruso, Husband, Klironomos, Larson, Maherali, Newmaster, Posluszny
- Physiology, Cellular and Molecular Biology -- Bewley, Emes, Greenwood, Mullen, Nassuth

This program involves faculty from two different departments: Integrative Biology and Molecular and Cellular Biology. A graduate student's department would be the same as their faculty advisor.

Administrative Staff

Chair, Department of Integrative Biology

Moira Ferguson (359 Axelrod, Ext. 53593)
mmfergus@uoguelph.ca

Chair, Department of Molecular and Cellular Biology

Chris Whitfield (1252 Science Complex, Ext. 53361)
cwhitfie@uoguelph.ca

Graduate Co-ordinator

Usher Posluszny (207 Axelrod, Ext. 52745)
uposlusz@uoguelph.ca

Graduate Secretary

Laurie Winn (256 Axelrod, Ext. 52730)
lwinn@uoguelph.ca

Graduate Faculty

Integrative Biology Faculty

Josef D. Ackerman

BSc Toronto, MA State Univ. of New York (Stony Brook), PhD Cornell - Associate Professor

Christina M. Caruso

BA Oberlin College, PhD Illinois - Assistant Professor

Brian C. Husband

BSc, MSc Alberta, PhD Toronto - Associate Professor

John N. Klironomos

BSc Concordia, PhD Waterloo - Associate Professor

Douglas W. Larson

BSc, PhD McMaster - Professor

Hafiz Maherali

BSc McGill, MSc, PhD Illinois - Assistant Professor

Steven G. Newmaster

BSc Guelph, PhD Alberta - Assistant Professor

Usher Posluszny

BSc, PhD McGill - Professor

Molecular and Cellular Biology Faculty

J. Derek Bewley

BSc, PhD Queen Elizabeth College (Uinv. of London), PDS London, FRSC - Professor

Michael J. Emes

BSc, PhD Sheffield - Professor and Dean of the College of Biological Sciences

John S. Greenwood

BSc, MSc McMaster, PhD Calgary - Associate Professor

Robert T. Mullen

BSc, PhD Alberta - Assistant Professor

Annette Nassuth

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

MSc Program

This program is primarily a learning experience for students to acquire the knowledge and skills necessary to complete high-quality research.

Admission Requirements

To be considered for admission, applicants should hold or obtain a baccalaureate degree in an honours program or equivalent from a recognized university or college and have an average academic standing of at least second-class honours (73% or 'B') during the last four semesters or two years of study.

Degree Requirements

Students in the MSc degree program are required to take courses, prepare and defend an acceptable research proposal, and prepare and defend an acceptable thesis.

Courses (minimum of 1.5 credits) which are acceptable to the department and the Dean of Graduate Studies as graduate credits, are required. Courses included in the Graduate Calendar have graduate credit. Undergraduate courses may be taken on the advisory committee's recommendation as additional courses.

Students must prepare a written research proposal on their research topic which is acceptable to their advisory committee. The oral presentation of the proposal is public. The research proposal may be taken as a course.

An acceptable thesis has to be prepared for the final MSc oral examination, at which time the thesis is defended. The usual duration of the MSc program is six semesters.

PhD Program

This program is more rigorous than the MSc degree and more research oriented. The research completed must have elements of originality and be publishable in a recognized peer-review journal.

Admission Requirements

Applicants for the PhD program should have a recognized master's degree with a 75% ('B') average in their postgraduate studies. Direct admission of honours baccalaureate graduates to the PhD program is normally not granted and will only be considered for students with a superior average academic standing (at least 80% or 'A-' during the last four semesters or two years of study).

Degree Requirements

Students in the PhD degree program are required to prepare and defend an acceptable research proposal, pass a qualifying examination, and prepare and defend an acceptable thesis. There are no specific minimum course requirements, except for students accepted directly after an honours baccalaureate degree (see under Degree Requirements for the MSc program).

Students must prepare a written research proposal on their research topic which is acceptable to their advisory committee. The oral presentation of this proposal is public.

The qualifying examination is used to determine whether or not the student has the academic foundation and native ability to complete the PhD degree. A student will be required to withdraw from the PhD program if the qualifying examination is not passed (one repeat is permitted).

An acceptable thesis has to be prepared for the final PhD oral examination, at which time this thesis is defended. The examination committee includes an appropriate external examiner. The usual duration of the program is twelve semesters.

Courses

Plant Physiology

BOT*6403 Seed Development and Germination (even years) U [0.50]

Physiological, biochemical and molecular aspects of seed development and germination and establishment of the seedling will be discussed in lectures and discussions of recent advances in the literature.

BOT*6438 Plant Metabolism U [0.50]

Physiological and biochemical aspects of the mechanism whereby plants sustain themselves. Emphasis will be placed on the interactions between different processes. Offered in conjunction with BOT*4380. Extra work is required of graduate students.

Cellular and Molecular Biology

BOT*6030 Plant Cell Biology (odd years, first offered in 2003) U [0.50]

An examination and discussion of structure-function relationships at the subcellular level during plant growth and development. Organelles and their roles in biosynthetic, bioenergetic, and physiological processes that are unique to plants will be examined. Offered in conjunction with P BIO*4030. Extra work is required of graduate students.

IBIO*6100 Molecular Evolution U [0.50]

This course is designed to provide students with an appreciation for the uses of molecular data in the study of evolutionary processes. An overview of the principles of molecular data analysis using a phylogenetic approach will be given. In addition, the importance of incorporating evolutionary history into biodiversity research and other applied topics will be emphasized. Laboratory sessions will be devoted to practical training in analytical tools using specialized computer software, and for student presentation of independent research projects. The course will involve practical training in molecular data analysis using a phylogenetic approach and discussion of current topics from the primary literature

BOT*6601 Molecular Basis of Plant-Microbe Interactions U [0.50]

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 P BIO*4000. Extra work is required of graduate students. Also offered as ENVB*6040.

Plant Anatomy and Morphology

BOT*6405 Modern Approaches to Plant Ultrastructure U [0.50]

An introduction to some of the recent advances in electron microscopy and laser scanning confocal microscopy and their application to ultrastructural studies of plant systems.

General**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.

Business Studies

The University offers an interdepartmental program of study leading to the degree of master of business administration (MBA) in the field of agribusiness management. The participating units are the Departments of Agricultural Economics and Business, Marketing and Consumer Studies, Economics, and the School of Hospitality and Tourism Management.

Administrative Staff

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

Patti Lago

Manager, MBA Graduate Program (150 Research Lane, Suite 205, Ext. 56607)
plago@uoguelph.ca

Joe Barth

Interim Associate Dean, Faculty of Management (207 MINS, Ext. 54867)
jbarth@uoguelph.ca

Ralph Sykes

Director of Graduate Programs, Faculty of Management (150 Research Lane, Suite 205, Ext. 56630)
rsykes@uoguelph.ca

Graduate Program Co-ordinator

Elliott Currie (215 McLN, Ext. 52100)
ecurrie@uoguelph.ca

Graduate Faculty

M. Rick Bates

Associate Professor, Agricultural Economics and Business

Francesco Braga

Associate Professor, Agricultural Economics and Business

Maury E. Bredahl

Professor and Chair, Agricultural Economics and Business

John Cranfield

Associate Professor, Agricultural Economics and Business

F. Harry Cummings, Professor

Joint appointment with the School of Environmental Design and Rural Development

Elliott Currie

Assistant Professor, Agricultural Economics and Business

Brady J. Deaton

Assistant Professor, Agricultural Economics and Business

Glenn Fox

Professor, Agricultural Economics and Business

Thomas F. Funk

Professor, Agricultural Economics and Business

Spencer Henson

Professor, Agricultural Economics and Business

Karl D. Meilke

Professor, Agricultural Economics and Business

Craig J. Pearson

Dean, Ontario Agricultural College and Professor, Agricultural Economics and Business

Wayne C. Pfeiffer

Associate Professor, Agricultural Economics and Business

Donna T. Ramirez

Assistant Professor, Agricultural Economics and Business

Rakhal C. Sarker

Assistant Professor, Agricultural Economics and Business

David Sparling

Associate Professor, Agricultural Economics and Business

Ralph Sykes

Director of Graduate Programs, Faculty of Management

Francis Tapon

Professor, Economics Department

Erna van Duren

Associate Professor, Agricultural Economics and Business

Alfons J. Weersink

Professor, Agricultural Economics and Business

Affiliated Faculty from Hospitality and Tourism Management

Refer to: <http://www.uoguelph.ca/graduatestudies/calendar/gradprog/htm-gradfac.shtml>

MBA Program

Admission Requirements

The minimum requirement for admission to the program is a baccalaureate in an honours undergraduate program or equivalent from a recognized university or college with an

average standing of at least a 'B-' (second-class honours or 70-72%) in the last four semesters or two years, and two letters of recommendation from former professors and/or employers or colleagues. GMAT scores may be requested in certain cases where it is difficult to judge an applicant's suitability. A minimum of two years of relevant industry experience in a managerial capacity is preferred. A resume or CV is also required outlining relevant work experience. Applicants must also submit a statement of interest in agribusiness management. The program has a single entry, in the Fall Semester.

Degree Requirements

The University of Guelph MBA program involves a core group of courses that build and develop key managerial skills, and specialization courses that allow participants to apply concepts and skills to management situations in a particular industry. Case studies are widely used.

Participants normally complete their program by a research project or thesis and may substitute two courses for the research project or thesis. Program prerequisites include supervisory and management experience in Agriculture and Agribusiness.

Course Requirements

The minimum number of semester-long courses (or equivalents) required for the MBA in Agribusiness degree is 15 which may include a major project. Course performance evaluations will be based on examinations, participation, presentations, written reports, and problem sets. Students will be evaluated on an individual basis and as part of group efforts. The program will normally take three semesters over twelve months for completion of the major project paper.

The business core required for all students includes the basic "tools" courses found in most business programs: accounting, marketing, research methods, communication, finance, economics, human resource management, and operations. Where appropriate, case studies will be used extensively to illustrate and demonstrate applications of these tools.

The similarities between agribusiness industries will facilitate using industry-based cases rather than "generic" case studies found in most business programs. Thus, industry issues can be explored concurrently with the teaching of a basic set of business tools.

The specialization core focuses on the unique aspects and issues facing agribusiness industries. Subjects include strategic management and business policy in an ever-changing, global market, environmental issues and their impact on agribusiness, the impact of government policy on agribusiness, the development and implementation of effective strategies for dealing with price risk in financial and agricultural markets. The importance of written and verbal communications and formal presentations is recognized in all courses.

Electives allow students to tailor their studies to fit their individual interests and goals. Students may choose from a number of different courses from across the university to increase their breadth of knowledge and understanding. The selection of electives must be approved by the MBA in Agribusiness Program Committee.

Students may elect to complete a major project paper which will be a capstone project. It will be the equivalent of a two-semester course, taken in the second and third semesters of the program. The subject and content will be jointly determined by students and their advisory committees and must be approved by the MBA in Agribusiness Program Committee. The project paper will focus on an issue or a problem in the industry. The project paper could be a business feasibility study, a marketing plan, an in-depth case study, an industry analysis, or any other topic that the students and their committees deem appropriate and worthwhile. It is an opportunity for students to apply what they have learned in the classroom and to concentrate on an area or issue that interests them.

Advisory Committee

Students who elect to complete a major project will select an advisory committee no later than the end of their second semester. The advisory committee will consist of the advisor (who will serve as committee chair) and at least one other graduate faculty member (who may be from a second department). The committee will be responsible for advice and guidance on curriculum and progress, selection of an appropriate topic for the project paper, work on the paper, and final evaluation of the paper.

The project paper will be presented in an open seminar at the end of the third semester in collaboration with the MBA in Agribusiness Program Committee.

Courses

See Graduate Co-ordinator.

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, organic, physical, theoretical (also chemical physics) and polymer chemistry, and biochemistry. 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

Adrian L. Schwan (336 MacNaughton, Ext. 58781)
schwan@chembio.uoguelph.ca

Administrative Assistant for the Centre

Andrea Wetmore (334 MacNaughton, Ext. 53848)
gwc@uoguelph.ca

Chair of the Department at Guelph

Robert J. Balahura (267 Chemistry & Microbiology, Ext. 53061)
balahura@chembio.uoguelph.ca

Departmental Graduate Co-ordinator

Daniel F. Thomas (120 MacNaughton, Ext. 53961)
thomas@chembio.uoguelph.ca

Departmental Graduate Secretary

Krystyna Czernicki (262 Chemistry & Microbiology, Ext. 53044)
kczernic@uoguelph.ca

Graduate Faculty

France-Isabelle Auzanneau

Maitrise, DEA, PhD Paris XI-Orsay - Associate Professor

Mark Baker

BSc Sussex, MSc, PhD East Anglia - Professor

Nigel J. Bunce

BA, MA, DPhil Oxford - Professor

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

Saul Goldman

BSc, PhD McGill - Professor

Bryan R. Henry

BSc British Columbia, PhD Florida State - Professor

Abdelaziz Houmam

Maitrise Casablanca I, DEA, PhD Paris 7 - 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

Marcel Schlaf

Diplom (Bayerische Julius-Maximilian Universität), PhD (Toronto) - Associate Professor

W.W.L. Tam

BSc (Hong Kong), PhD (Toronto) - Associate Professor

Peter Tremaine

BSc Waterloo, PhD Alberta - Professor and Dean of the College of Physical and Engineering Science

Nicholas P.C. Westwood

BSc, PhD Southampton - Professor

Janet M. Wood

BSc Victoria, PhD Edinburgh - Professor

Graduate Faculty from University of Waterloo

Monica Barra

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

Peter F. Bernath

BSc Waterloo, PhD Massachusetts Institute of Technology - Professor

Jeff Z. Chen

BSc Fudan, PhD Maryland - Professor

J. Michael Chong

BSc, PhD British Columbia - Professor

Thorsten Dieckmann

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

Gary I. Dmitrienko

BSc, PhD Toronto - Associate Professor

Jean Duhamel

BEng, MSc, PhD (ENSIC, Nancy, France) - Associate Professor

Xiangdong Fang

BS USTC China, MS, PhD Michigan - Assistant Professor

Eric Fillion

BSc Sherbrooke, MSc Montreal, PhD Toronto - Assistant Professor

Mario Gauthier

BSc, PhD McGill - Professor

Tadeusz Gorecki

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

Bruce M. Greenberg

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

J. Guy Guillemette

BSc, PhD Toronto - Associate Professor

John F. Honek

BSc, PhD McGill - Professor

Vassili Karanassios

BSc Thessaloniki, PhD Alberta - Professor

Holger Kleinke

BSc, MSc Westfälische-Universität Münster, PhD Johannes-Gutenberg Universität Mainz - Associate Professor

Robert J. LeRoy

BSc, MSc Toronto, PhD Wisconsin - Professor

K. Tong Leung

BSc, PhD British Columbia - Professor

Wing-Ki Liu

BSc, MSc, PhD Illinois - Professor

Frederick R.W. McCourt

BSc, PhD British Columbia - Professor

Terrance B. McMahon

BSc Alberta, PhD California Institute of Technology - Professor and Department Chair

Elizabeth M. Meiring

BSc Waterloo, PhD Cambridge - Associate Professor

Susan R. Mikkelsen

BSc (British Columbia), PhD (McGill) - Professor

Linda F. Nazar

BSc British Columbia, PhD Toronto - Professor

Marcel Nooijen

BSc, PhD Vrije Universiteit van Amsterdam - Associate Professor

Richard T. Oakley

BSc, MSc, PhD British Columbia - Professor

Michael Palmer

MD Giessen - Assistant Professor

Janusz Pawliszyn

BSc, MSc Gdansk (Poland), PhD Southern Illinois - Professor, NSERC/Supelco/Varian Industrial Research Chair in New Analytical Methods and Technologies

Alexander Penlidis

DiplEng Thessaloniki, PhD McMaster - Professor

William P. Power

BSc, PhD Dalhousie - Associate Professor

Russell Rodrigo

BSc Ceylon, PhD Nottingham - Adjunct Professor

James J. Sloan

BSc, PhD Queen's - Professor

Scott Taylor

BSc McGill, MSC, PhD Toronto - Associate Professor

MSc Program**Admission Requirements**

Non-Canadian applicants whose first language is not English are required to submit evidence of proficiency in the English language or pass the Test of English as a Foreign Language (TOEFL). A minimum score of 580 is required.

MSc Program

An applicant is eligible for admission to the MSc program if he/she has an honours bachelor of science degree, or the equivalent, with first- or upper second-class standing from an accredited university.

MSc Co-operative Option

An applicant is eligible for admission to the MSc co-operative option if he/she is a Canadian citizen or permanent resident and has honours bachelor of science degree, or the equivalent, with first- or upper second-class standing from an accredited university. The co-op MSc option is not available to students who have completed a co-op program as undergraduates. These students are, however, eligible for admission to the co-op PhD program.

Degree Requirements**MSc Program**

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

MSc Co-operative Option

The academic requirements are the same as in the regular MSc program, but at least two of the required four semester-long courses (including CHEM*7940) must be completed during the first two semesters of study. The student will spend the following two semesters (eight months) working in an industrial or government laboratory, upon completion of which he/she must present an acceptable work report. After returning to campus, the student will complete his/her course work and research and prepare the MSc thesis.

Part-Time Course-Based MSc Program

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

PhD Program**Admission Requirements**

Non-Canadian applicants whose first language is not English are required to submit evidence of proficiency in the English language or pass the Test of English as a Foreign Language (TOEFL). A minimum score of 580 is required.

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.

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 will be eligible for admission to the PhD co-operative option if he/she is a Canadian citizen or permanent resident and has an honours bachelor of science degree, or the equivalent, with first- or upper second-class standing from an accredited university.

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.

PhD Co-operative Option

Students registered in the PhD program may proceed to that degree under the co-operative option. Under this option four of the six required semester-long courses (including CHEM*7950) 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. Registration in the co-operative option commits students to the acceptance of employment either through a regular interview procedure organized by Career Services, Counselling and Student Resource Centre at the University of Guelph or by the Department of Co-operative Education and Career Services at the University of Waterloo; or, where their interests are best served, on an assignment specified by the centre. 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.

Interdepartmental Programs**Toxicology MSc/PhD Collaborative Program**

The Department of Chemistry participates in the MSc/PhD program in toxicology. Professor Bunce is a member of the Toxicology Interdepartmental Group. His research and teaching expertise includes aspects of 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 fifth having the following significance: 1 (inorganic), 2 (analytical), 3 (biochemistry), 4 (theoretical), 5 (physical), 6 (organic), and 7 (polymer).

Inorganic**CHEM*7100 Selected Topics in Inorganic Chemistry I U [0.50]**

Discussion of specialized topics related to the research interests of members of the centre. Special topics could include, for example: bioinorganic chemistry; inorganic reaction mechanisms; synthetic methods in inorganic and organometallic chemistry; homogeneous and heterogeneous catalysis; chemistry of polynuclear compounds.

CHEM*7110 Selected Topics in Inorganic Chemistry II U [0.50]

Discussion of specialized topics related to the research interests of members of the centre. Special topics could include, for example: bioinorganic chemistry; inorganic reaction mechanisms; synthetic methods in inorganic and organometallic chemistry; homogeneous and heterogeneous catalysis; chemistry of polynuclear compounds.

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, Hückel and extended Hückel methods for molecules and clusters. Perturbation theory. Applications of group theory in inorganic chemistry; Jahn-Teller effects in molecules and solids. Energy bands in one, two and three dimensions. Prerequisites: three semester-long undergraduate courses in inorganic chemistry and one semester-long undergraduate course in quantum mechanics or group theory.

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 I 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*7210 Selected Topics in Analytical Chemistry II 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*7220 Selected Topics in Analytical Chemistry III 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*7230 Selected Topics in Analytical Chemistry IV 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 (LLC, LSC, GPC, 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 chronamperometry, 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 I 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*7320 Selected Topics in Biochemistry II 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*7330 Selected Topics in Biochemistry III 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]
Mechanisms of regulation of metabolism - enzyme clusters; phosphorylation and protein kinases/phosphatases, repression and induction, protein turnover. Regulation of transcription, translation and mRNA processing. Cell cycle and control of cell division.
CHEM*7370 Enzymes U [0.50]
Mechanisms of rate enhancement. Enzyme kinetics - steady state; inhibitors; bisubstrate enzymes; fast reaction kinetics. Enzyme reaction mechanisms. Structural and genetic modification of enzymes. Catalytic antibodies. Binding processes. Multiple sites and co-operativity. Allosteric enzymes and metabolic control. Catalysis by RNA.
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 I 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*7410 Selected Topics in Theoretical Chemistry II 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*7420 Selected Topics in Theoretical Chemistry III 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*7430 Selected Topics in Theoretical Chemistry IV 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 I 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*7510 Selected Topics in Physical Chemistry II 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*7520 Selected Topics in Physical Chemistry III 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*7530 Selected Topics in Physical Chemistry IV 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]

Empirical analysis. Kinetic theory of gases. Potential energy surfaces. Unimolecular rates. Relaxation and steady state methods. Diffusion rates. Rates between polar molecules. Energy transfer.

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 I 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*7610 Selected Topics in Organic Chemistry II 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*7620 Selected Topics in Organic Chemistry III 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*7630 Selected Topics in Organic Chemistry IV 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 I 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.

CHEM*7740 Selected Topics in Polymer Chemistry II 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.

CHEM*7750 Selected Topics in Polymer Chemistry III 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.

CHEM*7760 Selected Topics in Polymer Chemistry IV 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.

CHEM*7770 Selected Topics in Polymer Chemistry V 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.

CHEM*7780 Selected Topics in Polymer Chemistry VI 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.

CHEM*7790 Selected Topics in Polymer Chemistry VII 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.

CHEM*7800 Selected Topics in Polymer Chemistry VIII 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.

CHEM*7810 Selected Topics in Polymer Chemistry IX 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.

CHEM*7820 Selected Topics in Polymer Chemistry X 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 Research Project (MSc) 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

Chair

Christopher Brown (1436 OVC, Ext. 52781)
cmbrown@ovc.uoguelph.ca

Graduate Co-ordinator

J. Scott Weese (2524 OVC, Ext. 54064)
jsweese@ovc.uoguelph.ca

Graduate Secretary

Colleen O'Brien (1439 OVC, Ext. 54005)
cobrien@uoguelph.ca

Graduate Faculty

Dana G. Allen

DVM, MSc Guelph, Dipl. ACVIM - Professor

John D. Baird

BVSc, PhD Sydney - Professor

Alexa Bersenas

BSc, DVM Guelph, Dipl. ACVECC - Assistant Professor

Ludovic Bouré

DVM Toulouse, MSc Montreal, Dipl. ECVS - Assistant Professor

Brigitte Brisson

DVM Montreal, DVSc Guelph - Assistant Professor

Christopher Brown

BSc, BVSc Liverpool, PhD Bristol, Dipl. ACVIM - Professor and Chair

Antonio Cruz

DVM, MVM, MSc, Dr.Med.Vet, Dipl. ACVS, Dipl. ECVS - Associate Professor

Robert Cruz

DVM Zulia, MSc Colorado - Assistant Professor

Howard Dobson

BVM&S Edinburgh, Dipl. Vet. Surgery, DVSc Guelph, Dipl. ACVR - Associate Professor

Doris Dyson

BSc, DVM, DVSc Guelph, Dipl. ACVA - Associate Professor

Jan Hall

BVM&S, MS, MRCVS, DACVD (Dermatology) - Assistant Professor

Krista Halling

DVM Guelph - Associate Professor

Joanne Hewson

DVM, DACVIM (LA) - Associate Professor

David L. Holmberg

BS, DVM Minnesota, MVSc Saskatchewan, Dipl. ACVS - Professor

Mark M. Hurtig

DVM Guelph, MVSc Saskatchewan, Dipl. ACVS - Associate Professor

Carolyn L. Kerr

BSc, DVM, DVSc Guelph, PhD Western - Assistant Professor

Stephen A. Kruth

BA California State, DVM California, Dipl. ACVIM - Professor

Julius Liptak

BVSc Melbourne, MVet Sydney, FACS - Associate Professor

Karol A. Mathews

DVM, DVSc Guelph, Dipl. ACVECC - Associate Professor

Noel Moens

DVM Liege (Belgium), MVSc Saskatchewan, Dipl. AECVS - Assistant Professor

Stephanie Nykamp

DVM, Dipl. ACVR - Assistant Professor

Anthony C.G. Ogg

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

Michael R. O'Grady

BSc, DVM Guelph, MSc Ohio State, Dipl. ACVIM - Associate Professor

Lynne O'Sullivan

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

Joane Parent

BSc, DMV Montreal, MVSc Saskatchewan, Dipl. ACVIM - Professor

Peter W. Physick-Sheard

BVSc Bristol, MSc Guelph - Associate Professor

Roberto Poma

DVM Turin, DVSc Guelph, Dipl. Scientific Studies, Dipl. ACVIM Neurology - Assistant Professor

Melissa Sinclair

DVM Prince Edward Island, DVSc Guelph, Dipl. ACVA - Assistant Professor

Laura L. Smith-Maxie

DVM, MSc Guelph - Associate Professor

Henry Staempfli

Dr. Med. Vet. Bern, Dipl. ACVIM - Associate Professor

Donald Trout

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

Alexander Valverde

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

Laurent Viel

DVM Montreal, MSc, PhD Guelph - Professor

J. Scott Weese

DVM, DVSc Guelph, Dipl. ACVIM - Assistant Professor

Nick Whelan

BSc, BVSc, MVSc Massey - Assistant Professor

J. Paul Woods

DVM Guelph, MS Wisconsin, Dipl. ACVIM - Associate Professor

Anthony Yu

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

MSc 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.

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.

DVSc Program

The DVSc degree is offered in large animal surgery, small animal surgery, large animal medicine, small animal medicine, anaesthesiology, cardiology, neurology, ophthalmology, 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.

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

Admission Requirements

A doctor of veterinary medicine (DVM) or equivalent which would allow the applicant to be eligible for licensure to practice veterinary medicine in Ontario; or a doctor of veterinary medicine (DVM) or equivalent degree plus either an acceptable graduate diploma or an acceptable MSc or PhD degree with a high 'B' academic average. Students so admitted may be granted residency credit for up to two semesters in the DVSc program.

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.

This program provides the knowledge base so that foreign graduate students are able to, as appropriate, progress to the MSc or DVSc programs on an equal footing with North American graduate students who have completed a formal internship or equivalent clinical 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 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.

Courses

Medicine

CLIN*6010 Clinical Medicine F [0.50]

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

CLIN*6030 Clinical Medicine W [0.50]

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

CLIN*6031 Clinical Medicine S [0.50]

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

CLIN*6190 Neurology F [0.50]

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

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

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

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

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

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

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

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

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

CLIN*6570 Large Animal Internal Medicine I S [0.50]

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

CLIN*6580 Large Animal Internal Medicine II S [0.50]

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

CLIN*6590 Large Animal Internal Medicine III S [0.50]

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

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

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

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

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

Surgery

CLIN*6170 Clinical Surgery F [0.50]

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

CLIN*6180 Clinical Surgery W [0.50]

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

CLIN*6181 Clinical Surgery S [0.50]

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

CLIN*6270 Applied Surgical Principles U [0.25]

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

CLIN*6310 Advanced Equine Veterinary Orthopaedics U [0.50]

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

Prerequisite(s): DVM or BSc

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

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

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

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

CLIN*6620 Ruminant Surgery W [0.50]

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

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

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

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

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

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

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

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

A discussion, reading and investigative course on research methods in comparative anesthesiology. Course CLIN*6420 is normally a prerequisite.

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 W [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.

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 spring semesters respectively.

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 spring semesters respectively.

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 spring semesters respectively.

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

Computing and Information Science

The Department of Computing and Information Science offers a program of study leading to the MSc and PhD degrees in computer science.

Administrative Staff

Chair

Wlodek Dobosiewicz (222 Reynolds, Ext. 52250)
chair@cis.uoguelph.ca

Graduate Co-ordinator

Pascal Matsakis (303 Reynolds, Ext. 58270)
matsakis@cis.uoguelph.ca

Graduate Secretary

Edna Mumford (224 Reynolds, Ext. 56402)
edna@cis.uoguelph.ca

Graduate Faculty

Dilip K. Banerji

BTech Indian Inst. of Tech., MSc Ottawa, PhD Waterloo - Professor

David A. Calvert

B.A. Hnrs. Guelph, MSc, Guelph, PhD Waterloo - Assistant Professor

David K.Y. Chiu

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

Mieso Denko

BSc Addis Ababa (Ethiopia), MSc Wales, PhD Natal (S. Africa) - Assistant Professor

Wlodek Dobosiewicz

BSc, MA, MSc, PhD Warsaw - Professor and Chair

William Gardner

BSEE MIT, BEd Toronto, PhD Victoria - Assistant Professor

Gary Gréwal

BSc Brock, MSc, Guelph, Ph.D. Guelph - Assistant Professor

Stefan C. Kremer

BSc. Hnrs. Guelph, Ph.D. Alberta - Associate Professor

Xining Li

BSc, MSc Nanjing, PhD Calgary - Professor

Qusay H. Mahmoud

BSc, MSc New Brunswick, PhD Middlesex - Assistant Professor

Jay C. Majithia

BSc London, MEng, PhD McMaster - Professor Emeritus

Pascal Matsakis

BSc, MSc, PhD Paul Sabatier (France) - Associate Professor

Nidal H. Nasser

BSc, MSc Kuwait, PhD Queen's - Assistant Professor

Blair Nonnecke

BSc, MSc Guelph, PhD South Bank - Assistant Professor

Charlie F. Obimbo

MSc Kiev, PhD New Brunswick - Assistant Professor

Joseph Sawada

BSc, PhD Victoria (British Columbia) - Assistant Professor

Fei Song

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

Deborah A. Stacey

BSc Guelph, MAsc, PhD Waterloo - Associate Professor

David A. Swayne

BSc Waterloo, MA York, PhD Waterloo - Professor

Judi R. Thomson

BEd, BSc, MS, PhD Saskatchewan - Assistant Professor

Fangju Wang

BE Changsha, MSc Peking, PhD Waterloo - Professor

Mark Wineberg

BSc Toronto, MSc, Phd Carleton - Assistant Professor

Michael A. Wirth

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

Yang Xiang

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

MSc Program

The MSc program emphasizes research that can potentially contribute to industry and government. Interaction with other disciplines is encouraged. The program is based on three areas of technical specialization: (1) parallel and distributed computing, (2) interactive software environments, and (3) artificial intelligence. Research in the department is conducted by groups centred in these areas of activity. Research in distributed systems includes distributed databases, VLSI design automation, computer architecture and

networks, and parallel processing. Research in interactive software environments includes human-computer interaction, user-interface software and hypertext. Research in artificial intelligence includes uncertainty management, knowledge acquisition, expert systems, image processing, neural networks and pattern recognition. In addition, applied research is carried out in areas such as information management, including geographical-information systems, statistical databases, and office information systems.

Admission Requirements

Most available spaces will be filled in March for entry the following September. A limited amount of spaces will be filled in October for entry the following January. Students who are considering applying to the department should first check the departmental website for admission procedures and deadlines.

General Requirements

To be considered for admission, applicants must meet the minimum admission requirements of both the university and the department, including at least a 75% ('B') average during the previous two years of full-time university study for a degree. For applicants whose first language is not English, a minimum of 600 on the TOEFL is required (250 for computer-based test). Applicants must possess a four-year honours degree in computer science. However, a student with a minor in computer science and an honours degree in another applicable discipline may be granted provisional admission. We encourage students with such backgrounds to apply.

Course Requirement

Entrants are expected to have previously taken 11 of the following courses from University of Guelph (or equivalent courses from another recognized university).

An object-oriented programming course such as CIS*1650 or CIS*2430

An advanced programming course such as CIS*2500

A course on data structures such as CIS*2420 or CIS*2520

A course on operating systems such as CIS*3110

A course on software engineering such as CIS*3200 or CIS*3760

A course on algorithm analysis such as CIS*3490

A course on databases such as CIS*3530

A course on computer architecture such as CIS*4050

A computer networks course such as CIS*3210

A course on computation theory such as CIS*4600 or CIS*4620

A course on artificial intelligence such as CIS*4750 or CIS*4770

A course on computer vision such as CIS*4760 or CIS*4720

A course on pattern recognition such as CIS*4760 or CIS*4730

A course on computer graphics such as CIS*4800

Three university level maths/stats courses.

English Proficiency

The TOEFL is required of all applicants whose first language is not English. For the Internet-Based TOEFL the applicant's overall score should be at least 89, with no individual component less than 21. For the Computer-Based TOEFL the score should be at least 250, and for the Paper-Based TOEFL it should be at least 600. The TOEFL requirement can be waived in exceptional circumstances only (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).

Degree Requirements

Degree requirements include a technical communication and research methodology course such as CIS*6890, at least four other graduate-level courses, a research seminar and a master's thesis. There is no qualifying exam or second-language requirement.

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 five semesters.

Advisory Committee

Each MSc candidate conducts thesis research by working closely with a thesis advisor. The advisor is a member of the CIS graduate faculty who provides academic guidance and interacts regularly with the student. Moreover, the student is required to have an Advisory Committee consisting of at least two graduate faculty members. The student's advisor chairs the committee. Graduate faculty members from other academic units can sit in the committee.

Course Requirement

Graduate courses are organized around the areas of specialization mentioned earlier. An MSc student is required to take CIS*6890 and at least four other graduate courses. Of these four courses, at least two should be in the student's research area and at least two outside. In exceptional cases, one graduate-course requirement may be met by an approved 0.5-credit graduate course from another department or by two approved 400-level 0.5-credit courses which have not already been taken for credit. At most one reading course (CIS*6660) can count towards the course requirement. The specific course requirement

for each student will be determined in consultation with the thesis advisor and Advisory Committee, subject to the above constraints.

Seminar Requirement

An MSc student must give one publicly announced research seminar on his/her MSc thesis research. The seminar must be presented before the final semester of the candidate, and no earlier than the third semester after entering the program. It should be attended by the student's advisor and at least one other CIS faculty 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 candidates 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 (Day 0). The student must submit his/her MSc thesis to the Advisory Committee at least 3 weeks prior to Day 0, and to the Examination Committee at least 2 weeks prior to Day 0. For the composition of the Examination Committee, see Graduate Calendar > Degree Regulations > Master of Science > Thesis. The examination consists of an oral presentation by the candidate followed by questions from the Examination Committee.

PhD Program

The Department of Computing and Information Science offers the PhD degree in Computer Science in the fields of applied modeling, data and knowledge management, distributed computing, and natural computation as detailed below:

1. **Applied Modeling (AM):** Students working in this field will engage in research on topics such as environmental modeling, optimization algorithms, performance analysis, and simulation.
2. **Data and Knowledge Management (DKM):** Students working in this field will engage in research on topics such as bioinformatics and biocomputing, data mining and machine learning, geographic information systems, image analysis, information retrieval, relational and deductive database systems, uncertain inference and decision support systems.
3. **Distributed Computing (DC):** Students working in this field will engage in research on topics such as distributed database systems, distributed systems, embedded systems, multi-agent systems, mobile computing, wireless networks, and ad hoc networks.
4. **Natural Computation (NC):** Students working in this field will engage in research on topics such as genetic algorithms and neural networks.

Admission Requirements

Most spaces are filled in March for entry the following September, and in October for entry the following January. Students who are considering applying to the department should first check the departmental website for admission procedures and deadlines.

General Requirements

Admission to the PhD program in CIS will normally require a recognized Master's degree in Computer Science or a closely related discipline obtained with high academic standing. Students who are considering applying to the department should first check the departmental website for admission procedures and deadlines. 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

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 their Master's degrees

English Proficiency

The TOEFL is required of all applicants whose first language is not English. For the Internet-Based TOEFL the applicant's overall score should be at least 89, with no individual component less than 21. For the Computer-Based TOEFL the score should be at least 250, and for the Paper-Based TOEFL it should be at least 600. The TOEFL requirement can be waived in exceptional circumstances only (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).

GRE Tests

Students who have obtained a Masters degree from a university outside of Canada are required to supply GRE scores (GRE General and/or GRE Subject in CS). Applicants with high GRE scores will be considered favorably in the admission process.

Admission without an MSc Degree

A student who has achieved excellent standing in an honours Computer Science degree (or an equivalent 4-year CS degree) and who wishes to proceed to doctoral study may enroll, 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.

A student who has completed an honors Computer Science degree (or an equivalent 4-year CS 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, demonstration of research promise, and strong letters of recommendation.

Transfer From Another PhD Program

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

- a program transfer application form
- transcripts from all past programs
- a written description summarizing the progress in the previous program including the qualifying examination.

Transfer from a PhD program at another Canadian university will follow the same principles.

Part-Time Study

Students may not enter the CIS 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 course requirements 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:

- Completing the minimum specified duration of the program.
- Completing 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 CIS*6890 and at least eight other graduate courses.
- Satisfying the breadth requirement.
- Completing 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.

Advisory Committee

Each PhD candidate conducts thesis research by working closely with a thesis advisor. The advisor is a member of the CIS graduate faculty who provides academic guidance and interacts regularly with the student. Moreover, the student is required to have an Advisory Committee containing no few than three members of the graduate faculty (in the selection of whom the student normally participates). The student's advisor chairs the committee. At least one of the committee members must be from another department.

Course Requirement

A PhD student, following the completion of a recognized master's degree in Computer Science or related discipline, is required to take CIS*6890 (unless the student has taken an equivalent course in the MSc program) and at least four other graduate courses. Of these four courses, at most one may be co-listed (that is, a combined graduate/undergraduate course), at most one may be a reading course (CIS*6660), and at most one may be taken from departments other than CIS.

A PhD student admitted without an appropriate MSc is required to take CIS*6890, and at least eight graduate courses. Out of these eight courses, at most two may be co-listed, at most two may be reading courses (CIS*6660), and at most two may be taken from departments other than CIS.

Breadth Requirement

A PhD student is required to satisfy the breadth requirement in 8 areas of Computing Science divided into 3 categories:

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)

A student must have sufficient background in six of the eight 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 (with grade of at least 70%), or
- has taken an equivalent course in the MSc program, or
- has extensive industrial experience in the area, or
- has written an MSc thesis in the area.

The table below show how current graduate courses in the curriculum are mapped into each area. Note that the area for a *Topics in Computer Science* course such as CIS*6650 or CIS*6660 varies depending on the need and the instructor.

AREA	COURSES
S1	6000, 6140, 6160, 6450 (6650, 6660)
S2	6130 (6650, 6660)
S3	6090, 6100, 6200 (6650, 6660)
M1	6070, 6150, 6490 (6650, 6660)
M2	6060 (6650, 6660)
A1	6020, 6050, 6080, 6120, 6420 (6650, 6660)
A2	6030 (6650, 6660)
A3	6040, 6320 (6650, 6660)

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. A student seeking the approval of the breadth requirement should submit an application to the CIS Graduate Implementation Committee, normally at the start of the third semester. The Graduate Committee approves whether a student has satisfied the breadth requirement and suggests necessary courses if the requirement has not been met.

Seminar Requirement

A PhD student should give two publicly announced research seminars on his/her PhD thesis research. The first seminar must be presented before the semester when the Qualifying Examination is completed, and no earlier than the third semester after entering the program. The second seminar must be presented after the semester when the Qualifying Examination is completed, during the final year but before the final semester of the candidate. Each seminar should be attended by the student's advisor and at least one other CIS faculty member of the student's Advisory Committee. The quality of the presentation is graded on a pass/fail basis. The PhD seminar requirement is intended for candidates to practice presentation and communication skills and to participate in the process of knowledge dissemination as part of the academic life.

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 5 weeks prior to the anticipated date of the QE oral presentation (Day 0). The student must submit a research proposal to the Advisory Committee at least 3 weeks prior to Day 0, and to the Qualifying Examination Committee at least 2 weeks prior to Day 0. For the composition of the Examination Committee, see Graduate Calendar > Degree Regulations > Doctor of Philosophy > Qualifying Examination. The research proposal should contain the following items:

- A survey of appropriate background literature.
- A description of the proposed area of 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 candidate followed by questions from the Examination Committee.

Thesis Defence

Arrangements for the PhD thesis defence should be made at least 8 weeks prior to the anticipated date of the defence (Day 0). The student must submit his/her PhD thesis to the Advisory Committee at least 6 weeks prior to Day 0, and to the Examination Committee

at least 4 weeks prior to Day 0. For the composition of the Examination Committee, see Graduate Calendar > Degree Regulations > Doctor of Philosophy > Thesis. The examination consists of an oral presentation by the candidate followed by questions from the Examination Committee.

Courses

CIS*6000 Distributed Systems U [0.50]
The evolution of high-performance distributed computer systems. Models for distributed processing. Taxonomy and performance evaluation of multiprocessor systems. Interconnection networks. Memory and I/O system for multiprocessor architectures. Performance of distributed systems. Architectural issues of distributed database systems.
CIS*6020 Knowledge Representation and Expert Systems U [0.50]
The major features of expert systems today: a discussion of logic and rule-based systems; forward and backward chaining; frames, scripts, semantic nets and the object-oriented approach; the evaluation of expert systems and knowledge acquisition. A sizeable project is required and applications in other areas are encouraged.
CIS*6030 Advanced Database Systems U [0.50]
Relational database systems, advanced features of database management, concurrency protocols, data integrity, transaction management, distributed databases, remote access, data warehousing, data mining, and deductive databases.
CIS*6040 Advanced Image Analysis U [0.50]
An insight into advanced topics in image processing and analysis. A study of methods for analyzing and interpreting information from two and three-dimensional images obtained from a variety of medical and biological imaging modalities.
CIS*6050 Advanced Neural Networks: Dynamical Recurrent Networks U [0.50]
Artificial neural networks, dynamical recurrent networks, dynamic input/output sequences, communications signal identification, syntactic pattern recognition.
CIS*6060 Bioinformatics U [0.50]
Data mining and bioinformatics, molecular biology databases, taxonomic groupings, sequences, feature extraction, Bayesian inference, cluster analysis, information theory, machine learning, feature selection.
CIS*6070 Discrete Optimization U [0.50]
This course will discuss problems where optimization is required and describes the most common techniques for discrete optimization such as the use of linear programming, constraint satisfaction methods, and genetic algorithms.
CIS*6080 Genetic Algorithms U [0.50]
This course introduces the student to basic genetic algorithms, which are based on the process of natural evolution. It is explored in terms of its mathematical foundation and applications to optimization in various domains.
CIS*6090 Hardware/Software Co-design of Embedded Systems U [0.50]
Specification and design of embedded systems, system-on-a-chip paradigm, specification languages, hardware/software co-design, performance estimation, co-simulation and validation, processes architectures and software synthesis, retargetable code generation and optimization.
CIS*6100 Parallel Processing Architectures U [0.50]
Parallelism in uniprocessor systems, parallel architectures, memory structures, pipelined architectures, performance issues, multiprocessor architectures.
CIS*6120 Uncertainty Reasoning in Knowledge Representation U [0.50]
Representation of uncertainty, Demster-Schafer theory, fuzzy logic, Bayesian belief networks, decision networks, dynamic networks, probabilistic models, utility theory.
CIS*6130 Object-Oriented Modeling, Design and Programming U [0.50]
Objects, modeling, program design, object-oriented methodology, UML, CORBA, database
CIS*6140 Software Engineering U [0.50]
An introduction to the field of software engineering. Course covers issues such as requirements analysis, specifications, software architectures, quality assurance, and software metrics.
CIS*6150 Complexity of Parallel Computation U [0.50]
Computing models, sequential model, complexity models, evolution of parallelism, parallel complexity, P-completeness, survey of P and NC, open problems.

CIS*6160 Multiagent Systems U [0.50]
Intelligent systems consisting of multiple autonomous and interacting subsystems with emphasis on distributed reasoning and decision making. Deductive reasoning agents, practical reasoning agents, probabilistic reasoning agents, reactive and hybrid agents, negotiation and agreement, cooperation and coordination, multiagent search, distributed MDP, game theory, and modal logics.
CIS*6200 Design Automation in Digital Systems U [0.50]
Techniques and software tools for design of digital systems. Material covered includes high-level synthesis, design for testability, and FPGAs in design and prototyping.
CIS*6320 Image Processing Algorithms and Applications U [0.50]
Brightness transformation, image smoothing, image enhancement, thresholding, segmentation, morphology, texture analysis, shape analysis, applications in medicine and biology.
CIS*6420 Artificial Neural Networks U [0.50]
Neural networks, artificial intelligence, connectionist model, back propagation, resonance theory, sequence processing, software engineering concepts.
CIS*6450 Software Systems Development and Integration U [0.25]
Techniques and tools used in the development of large software systems. Methods for organizing and constructing modular systems, manipulating files, an introduction to interface design, and use of databases. Software tools for managing projects, database connectivity, configuration management, and system application programmer interfaces.
CIS*6490 Analysis and Design of Computer Algorithms U [0.25]
The design and analysis of efficient computer algorithms: standard methodologies, asymptotic behaviour, optimality, lower bounds, implementation considerations, graph algorithms, matrix computations (e.g. Strassen's method), NP-completeness.
CIS*6650 Topics in Computer Science I U [0.50]
This special topics course examines selected, advanced topics in computer science that are not covered by existing courses. The topic(s) will vary depending on the need and the instructor.
CIS*6660 Topics in Computer Science II U [0.50]
This is a reading course. Its aim is to provide background knowledge to students who need to get a head-start in their thesis research fields early during their program while no suitable regular graduate courses are offered. Admission is under the discretion of the instructor. <i>Restriction(s):</i> Requires instructor's signature.
CIS*6890 Technical Communication and Research Methodology F-W [0.50]
This course aims to develop students' ability in technical communication and general research methodology. Each student is expected to present a short lecture, review a conference paper, write a literature survey and critique fellow students' talks and lectures.

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 and public sector organizations. The department's graduate program leads to the master of science degree in consumer studies.

Administrative Staff

Chair

Paulette Padanyi (205 MINS Building, Ext. 53774/56126)

ppadanyi@uoguelph.ca

Graduate Co-ordinator

Karen Finlay (201C MINS Building, Ext. 53347)

kfinlay@uoguelph.ca

Graduate Secretary

Rita Raso (205 FACS, Ext. 56126)

rraso@uoguelph.ca

Graduate Faculty

Paul M. Anglin

BSc Toronto, MA, PhD Western Ontario - Associate Professor

John W. Auld

BA Brock, MA Guelph - Associate Professor

May Aung

BComm, MComm Burma, PhD York - Associate Professor

Scott R. Colwell

AGD, MBA Athabasca, PhD Bradford (United Kingdom) - Assistant Professor

Karen A. Finlay

BA Western Ontario, MBA, PhD Toronto - Associate Professor

William R. Frisbee

BA, MS Union College, PhD Cornell - Associate Professor

Thomas F. Funk

BS, MS, PhD Purdue - Professor

Towhidul Islam

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

Vinay Kanetkar

BArch Indian Inst. of Tech, MArch, MSc, PhD British Columbia - Associate Professor

John P. Liefeld

BComm Saskatchewan, MBA, DBA Oregon - Professor

Jane Londerville

MBA Harvard - Lecturer

Paulette S. Padanyi

BA Presbyterian College, MBA Florida, PhD York - Associate Professor and Chair

John L. Pratschke

BComm, MEconSc, PhD N.U.I. - Professor

Lefa Teng

BEng Jiangsu, MSc Beijing, PhD Concordia - Assistant Professor

Marjorie J. Wall

BHSc, MSc Guelph, PhD Ohio State - Professor

Anne Wilcock

BAsc Guelph, MSc, PhD Purdue - Associate Professor

Sunghwan Yi

BBA, MBA Seoul National, PhD Pennsylvania State - Assistant Professor

Lianxi Zhou

BEng, MSc Tianjin (China), PhD Concordia - Assistant Professor

MSc Program

The MSc program draws on a variety of disciplines for theory, concepts, and research methods. Students are required to successfully complete four departmental core courses, one in consumption behaviour theory and three graduate courses in measurement and analysis. Two elective courses are selected by the student in conjunction with the graduate coordinator and/or his/her advisory committee and are 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 consumer studies direct their course work and thesis research toward applications related to marketing within private and public 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 the marketing or consumer behaviour.

Students with a marketing orientation to their research complete theses in one of the following areas: consumer behaviour, advertising, pricing, services, or the management of marketing, frequently with respect to a specific industry (e.g., food, textiles & clothing, housing & real estate development, various services).

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 consumer studies seminar (COST6950) for each semester of full-time graduate study. The program consists of:

Fall Semester:

COST*6000	Consumption Behaviour Theory
COST*6050	Research in Consumer Studies
1 elective: If have not taken COST*3100 (Economic Behaviour of Households) or equivalent, take	
COST*6370	Consumer Economics OR an alternative elective*
COST*6950**	Department Seminar

Winter Semester:

COST*6080	Qualitative Methods
COST*6060	Multivariate Methods
(Or 2 suitable methods courses)	
1 elective*	
COST*6950**	Department Seminar

Note

*Chosen by the graduate student with the approval of the graduate coordinator and his/her advisory committee

Note

**Taken during each semester of full-time graduate study

Admission Requirements

Admission information and application forms 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 (see Department of Marketing and Consumer Studies web site for graduate faculty phone numbers and e-mail addresses).

All applicants should have completed a minimum of one course in statistics as well as intermediate microeconomics as part of their undergraduate program. Applicants are also encouraged to have completed courses in areas such as marketing, consumer behaviour, economics, 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 to apply for September admission to the masters 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, enrolment in the consumer studies seminar (COST*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.

Courses

For courses without a semester designation the student should consult the graduate co-ordinator.

COST*6000 Consumption Behaviour Theory F [0.50]

A review of the nature and scope of consumption behaviour and the approaches to studying the role of human consumption using the major theoretical perspectives.

COST*6010 Product Development and Management Systems U [0.50]

The development of organizational technology and innovation strategy; product/market-strategy formulation; issues associated with product development, product management and consumer affairs.

COST*6020 Marketing Strategy & Decision Support Systems U [0.50]
The application of knowledge about consumer behaviour, markets, research, problem-solving approaches, and concepts and principles of marketing to the analysis of marketing situations and problems, and the formulation of marketing strategy and policy. Includes the use of marketing-decision support systems, simulations and models for strategy formulation and decision making for product development, test marketing, and marketing-mix decisions.
COST*6050 Research in 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.
COST*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.
COST*6080 Qualitative Methods for Consumer Research W [0.50]
A review of the nature, importance and validity issues associated with qualitative research. Topics include theory and tactics in design, interpersonal dynamics, analysis of interaction and transcripts.
COST*6090 Special Topics in Consumer Research and Analysis U [0.50]
COST*6120 Marketing Management U [0.50]
A study of marketing decision-making with emphasis on the formulation of strategic marketing plans.
COST*6150 Quality Assurance Management U [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.
COST*6260 Special Topics in Food Marketing U [0.50]
COST*6300 Special Topics in Consumer Studies U [0.50]
COST*6310 Retail Systems and Strategy U [0.25]
The analysis and evaluation of evolving retailing systems. Topics include retail structure and strategy, environmental change and retail adaptation, location analysis and operation management.
COST*6320 Promotion Management U [0.25]
A review of the concepts, principles and theory of promotion and promotion management. Topics include the structure of the promotion and advertising industry, consumer decision-making, information processing, response to promotion, copy development, media selection, and evaluation.
COST*6350 Consumer, Business and Government Relations F,W [0.25]
The development of an original and critical perspective to major issue development and macro-level-policy formation processes concerned with business and government interfaces, business and consumer interfaces, and Canadian and international product/service standards, which provide structure for issue management and policy development.
COST*6370 Consumer Economics U [0.50]
An applied economics course focusing on aggregate consumption at the domestic/international level; financial and time allocation at the individual/household level; theoretical, mathematical and econometric analysis of consumption; applications to contemporary consumption issues and problems.
COST*6700 Special Topics in International Marketing U [0.50]
COST*6710 Special Topics in Marketing U [0.50]
COST*6720 Special Topics in Housing and Real Estate U [0.50]
COST*6950 Consumer Studies Seminar F,W [0.00]

Drama

Administrative Staff

Acting Director

David Murray (368 MacKinnon, Ext. 53881)
dmurray@uoguelph.ca

Graduate Co-ordinator

Paul Mulholland (429 MacKinnon, Ext. 53268)
pmulholl@uoguelph.ca

Graduate Secretary

Sharon Ballantyne (427 MacKinnon, Ext. 56315)
sballant@uoguelph.ca

Graduate Faculty

Alan D. Filewod

BA York, MA Alberta, PhD Toronto - Professor

Richard P. Knowles

BA, MA, PhD Toronto - Professor

Harry Lane

BA Durham, MA, PhD Toronto - Associate Professor

Mark Lipton

BA Concordia, MA, PhD New York - Assistant Professor

Paul A. Mulholland

BA, MA Toronto, PhD Birmingham - Associate Professor

Alan Shepard

BA St. Olaf College, PhD Virginia - Professor

Jerrard Smith

Associate Ontario College of Art - Assistant Professor

Judith Thompson

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

Ann Wilson

BA, MA, PhD York - Associate Professor

MA Program

The MA Program in Drama is designed to provide an intensive introduction to graduate-level work in the scholarly study of theatre, particularly to students with research interest in the program's primary focus, Canadian drama and theatre. A secondary focus is the drama and theatre of early modern (16th- and 17th-century) England in performance. However, supervision is available in a range of other areas, including modern British, American, and European drama, and various aspects of performance. Students interested in creative writing may apply to work with a distinguished writer on a creative thesis or research project.

Students may take courses in a variety of areas including dramatic literature, theatre history, and theory. The required core course, Approaches to Research and Theory, is designed to introduce students to research methodologies, leading eventually to individual projects using Guelph's major archival and library collections. The theatre archives at Guelph constitute the largest collection in Canada, with particular strengths in Ontario theatre and materials relating to Bernard Shaw.

Admission Requirements

The normal requirement for admission to the Drama MA program is the equivalent of an Honours degree in drama or literature from a recognized post-secondary institution with at least a high second-class standing (78% or higher) in the last year of study. Students with degrees with excellent academic records in other disciplines will also be considered, or may be allowed to do qualifying undergraduate courses at the University of Guelph prior to beginning graduate study.

Applicants are not required to write the Graduate Record Examination. In very exceptional circumstances, an applicant may lack the required Honours BA degree but may be assessed as qualified to undertake graduate studies in Drama on the basis of other experience and practice. For details, contact the Graduate Coordinator. Students wishing to enter the program normally do so in September. (Only under exceptional circumstances may students be considered for admission in either January or May).

Applications from international students are warmly encouraged, although the application procedures are somewhat more complex. 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. Sample minimum scores are 580 for TOEFL or 6.5 for the British Council test.

Degree Requirements

All entering MA students will register for the joint, required two-semester course, DRMA*6010 Approaches to Research and Theory. This course must be taken upon entrance, requiring that entering students be registered in both the first Fall and Winter semesters. Students may choose between two options for completion of degree requirements:

1. Course work option: the required DRMA*6010 plus four other courses, plus either DRMA*6500 Research Paper or DRMA*6280 Independent Reading Course
2. Thesis Option: the required DRMA*6010 plus two other courses, plus a thesis of 20,000 to 25,000 words (80-100 pages)

Creative Writing Option: 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/theoretical commentary.

Courses

Theory and Methodology

DRMA*6010 Approaches to Research and Theory U [1.00]

Introduces methodologies of graduate-level scholarship through a series of modules. Module 1 (required) focuses on a common text of imaginative literature, to introduce a range of theoretical and interpretative strategies and research tools. Subsequent modules (of which two are required) focus on particular issues in the study of literature and performance. NOTE: This course is offered over the fall and winter semesters. Students must register for both the fall and winter offerings of the course. They will receive an INP ("in progress") grade at the end of the fall semester and a final grade at the end of the winter semester.

DRMA*6220 Aspects of the Theory of Drama, Theatre, and Performance U [0.50]

Studies of selected theories of drama, theatre, and performance, and of particular theoretical issues and approaches.

Theatre History and Historiography

DRMA*6060 Aspects of Canadian Theatre History U [0.50]

A seminar on selected aspects of history of theatre as a practice and an institution in Canada.

DRMA*6080 Special Studies in Canadian Theatre U [0.50]

A detailed study of some particular aspect of Canadian theatre, providing opportunities for the student to pursue in depth an area of specialized research.

DRMA*6090 Aspects of Theatre in Early-Modern England U [0.50]

A seminar on selected aspects of the theatre of the 16th- and early 17th-centuries in England.

DRMA*6120 Aspects of 20th-Century Theatre U [0.50]

A seminar on selected aspects of theatre in the 20th century.

DRMA*6150 Special Studies in Theatre History U [0.50]

Detailed study of a particular aspect of theatre history, providing opportunities for the student to pursue in depth an area of specialized research.

DRMA*6180 Aspects of 19th-Century Theatre U [0.50]

A seminar on selected aspects of theatre in the 19th century.

Dramatic Literature and Criticism

DRMA*6020 Canadian Drama in English U [0.50]

Studies of Canadian scripts written in English, providing opportunities for detailed analyses of particular writings, periods or genres in their social and cultural contexts.

DRMA*6040 Quebec and Franco-Canadian Drama U [0.50]

Studies in Quebec and Franco-Canadian scripts written in French, providing opportunities for detailed analyses of particular writings, periods, or genres in their social and cultural contexts.

DRMA*6050 Special Studies in Canadian Drama U [0.50]

Detailed study of a particular aspect of Canadian drama, providing opportunities for the student to pursue in depth an area of specialized research.

DRMA*6100 English Drama to 1642 U [0.50]

Studies of selected scripts from the 16th- and early 17th-century in England, providing opportunities for detailed analyses of particular writings, periods, or genres in their social and cultural contexts.

DRMA*6130 Aspects of 19th-Century Drama U [0.50]

Studies of selected scripts from the 19th century, providing opportunities for detailed analyses of particular writings, periods, or genres in their social and cultural contexts

DRMA*6140 Aspects of 20th-Century Drama U [0.50]

Studies of selected scripts from the 20th century, providing opportunities for detailed analyses of particular writings, periods, or genres in their social and cultural contexts.

DRMA*6190 Special Studies in Drama U [0.50]

Detailed study of a particular aspect of dramatic literature, providing opportunities for the student to pursue in depth an area of specialized research.

Other Courses**DRMA*6280 Independent Reading Course U [1.00]**

Independent Reading Course

DRMA*6500 Research Paper U [1.00]**DRMA*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.

DRMA*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.

Economics

The Department of Economics www.economics.uoguelph.ca/econ offers programs of study leading to the MA and PhD degrees. A Co-op stream is available to a limited number of students in the MA program. Students may also register in this Department to take the Collaborative International Development Studies (CIDS).

Administrative Staff

Chair

John Livernois (710 MacKinnon, Ext. 58946)
live@uoguelph.ca

Graduate Co-ordinator

Ross McKittrick (730 MacKinnon, Ext. 53532)
mckitri@uoguelph.ca

Graduate Secretary

Anne Bolger (723 MacKinnon, Ext. 56341)
abolger@uoguelph.ca

Graduate Faculty

James A. Amegashie

BA Ghana, MA Queen's, MA Dalhousie, PhD Simon Fraser - Assistant Professor

Kurt Annen

MA, PhD Fribourg (Switzerland) - Assistant Professor

C. Bram Cadshy

BSc London School of Economics, MA Queen's, PhD MIT - Professor

Laurent Cellarier

BA, MA Limoges (France); PhD Southern California - Assistant Professor

Brian S. Ferguson

BA Mount Allison, MA Guelph, PhD Australian National - Associate Professor

Talat Genc

BS, MA Bogazici, MA, Ms, PhD Arizona - Assistant Professor

Louise A. Grogan

BSc London School of Economics, MA Catholique de Louvain, PhD Amsterdam - Assistant Professor

Michael J. Hoy

BMath Waterloo, PhD London School of Economics - Professor

Kris E. Inwood

BA Trent, MA, PhD Toronto - Professor

Stephen Kosempel

BA Queen's, MA Victoria, PhD Simon Fraser - Assistant Professor

John R. Livernois

BA Toronto, MA, PhD British Columbia - Professor and Chair

Chris J. McKenna

BSc Salford, DPhil York - Professor

Ross McKittrick

BA Queen's, MA, PhD British Columbia - Associate Professor

Anton Miglo

PhD St. Petersburg State, PhD Quebec (Montreal) - Assistant Professor

Miana Plesca

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

David M. Prescott

BA Durham, MA Warwick, PhD Queen's - Professor

Asha Sadanand

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

Clive Southey

BComm Natal, BA Capetown, PhD British Columbia - Associate Professor

Thanasis Stengos

BSc, MSc London School of Economics, PhD Queen's - Professor

Yiguo Sun

BSc Hebei Normal, MSc Hebei Teacher's, MA Guelph, PhD Toronto - Assistant Professor

Francis Tapon

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

Henry Thille

BComm Saskatchewan, MA, PhD British Columbia - Associate Professor

Ximing Wu

BA Peking, PhD Berkeley - Assistant Professor

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 will be asked to register as a non-degree undergraduate program for at least one semester. Satisfactory completion of prescribed undergraduate courses will be a prerequisite to admission to the MA program. 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 Dean of Graduate Studies that the student be transferred to regular graduate student status.

The first round of admission decisions are made at the end of February.

Degree Requirements

The MA requires the 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. 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. 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 major paper, 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*6050 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 (i).

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

MA Co-op Stream

This option is part of a number of initiatives designed to increase the readiness of our graduates for the workplace. The co-op program is available only to Canadians and permanent residents. Degree requirements are the same as for the existing MA with the addition of one or two (consecutive) work semesters (four or eight months) and the writing of a work report. The length of the program is four or five semesters. The location of the work placement is arranged jointly by the Department of Economics and the University's Co-op Office. Admission is based partly on academic performance and partly on the student's resume.

PhD Program

The Department of Economic offers a PhD in Economics with fields of specialization in econometrics and labour economics. PhD candidates may write a dissertation in these fields or in any of the areas of expertise of the graduate faculty in the department. In addition, the Department offers a PhD program in Resource and Environmental Economics in collaboration with the Department of Agricultural Economics and Business. (See PhD in Resource and Environmental Economics).

The objectives of the PhD program are to train individuals that already have a strong background in economics to become independent and skilled researchers in the fields of economics offered in the program. 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 chosen field of specialization and advanced competence in a second field, and to have demonstrated mature scholarship and research and communication abilities. At the same time, the objective of the PhD program is to prepare graduates for either an academic career or a career in the private or public sectors.

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 summarizes the program requirement:

Econometrics

All students must successfully complete the following courses:

ECON*6140	Econometrics I
ECON*6160	Econometrics II

Theory

All students must satisfy the requirement by successfully completing the following four courses and by successfully completing the comprehensive examination in economic theory.

ECON*6000	Microeconomic Theory I
ECON*6010	Microeconomic Theory II
ECON*6020	Macroeconomic Theory I
ECON*6040	Macroeconomic Theory II

Fields

All students must select two fields of specialization from the list below and must successfully complete the indicated course requirements in each field and successfully complete a comprehensive examination in each field.

Labour

ECON*6600	Labour Economics
ECON*6610	Topics in Labour Economics

Econometrics

ECON*6140	Econometrics I
ECON*6160	Econometrics II
ECON*6170	Topics in Econometrics

Resource and Environmental Economics

AGEC*6610	Economics of Renewable Resources
ECON*6800	Environmental Economics
ECON*6810	Economics of Non-Renewable Resources

Research Paper

During the summer of the second year and only after the theory comprehensive exams are passed, students must prepare a research paper under the supervision of a faculty member. Once the paper is deemed to be acceptable, the advisor notifies the Graduate Coordinator who in turn notifies the Dean 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.

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.

Interdepartmental Programs

Collaborative International Development Studies MA Program (CIDS)

The Department of Economics participates in the Collaborative International Development Studies (CIDS) 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 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.

Business Studies MBA Program

The Department of Economics participates in the MBA program in the fields of agribusiness management which is offered by the Department of Agricultural Economics and Business.

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 treatment of aggregate consumption, investment, government budgets, money demand and supply, aggregate demand, aggregate supply, inflation and unemployment, and open economy issues.

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*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 economic models. Topics include the classical linear regression model, t tests, structure tests, specification error, the consequences of the violation of the classical assumptions, detection and correction of autocorrelation and heteroscedasticity.

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 variable 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*6490 Monetary and Finance Theory U [0.50]

This course examines selected topics in monetary and finance theory. Topics may include: contingent claims markets, arbitrage asset-pricing, portfolio models, firm capital structure, government debt, real business cycles, cash-in-advance models, spatial money models, overlapping generations models, and traditional models of the demand and supply of money and monetary policy.

Environmental and Resource 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 Economics of Non-Renewable Resources 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.

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: AGE*6070. For graduate students outside the Department of Economics.

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 Graduate Program Services.

Engineering

The graduate degree programs in engineering include research and course work options, as well as full- and part-time studies. A thesis-based MSc degree program is available in four research fields: biological engineering, environmental engineering, engineering systems and computing, and water resources engineering. An MEng degree is offered in three areas: water resources engineering, environmental engineering and biological engineering.

The research-based MSc and PhD programs provide the opportunity to obtain advanced training in the engineering sciences and in research methodology through a variety of applied and basic research topics and courses. They provide for specialization in the fields of biological engineering, environmental engineering, engineering systems and computing, and water resources engineering. Biological engineering research concentrates biological processing environments and human factors; it covers physical processing of food, restructuring of foods and wastes, physical properties of biological materials, and biomechanics. Environmental engineering research examines methods to understand and enhance processes central to environmental protection. It includes the assessment of the fates of substances in the environment, development of new process technology and remediation of contaminated material and sites. Water resources engineering research concentrates on watershed engineering, hydrology, erosion, drainage & irrigation flood control, water-resource systems management, soil and water conservation, storm water and water-quality management. Engineering Systems & Computing research examines techniques, methods and procedures for systems where the computer plays an integral role. In today's society, a computer is intimately integrated into industrial processes and everyday appliances and equipment. Research encompasses aspects of software, hardware, intelligence as well as a focus on particular application areas. Software areas include real-time systems, embedded computing, distributed processing as well as communication systems. Hardware areas include VLSI, special purpose computing and embedded systems. Intelligent systems exploration into control, autonomous robotics, machine vision, image processing, soft computing and human-machine interfaces. Typically a research project will be within the scope of an application area, for example automation, biomedical, food sciences or environmental.

The objective of the MEng degree in biological engineering, water resources engineering and environmental engineering is to provide students (mostly practising engineers) the opportunity to extend their understanding of engineering principles involved in these disciplines beyond the coverage possible in an undergraduate program and to enlarge their grasp of the application of these principles to the solution of complex, practical problems. Areas of emphasis currently covered in water resources engineering are hydrologic modelling and model applications of water supply assessment, pollutant transport and management, watershed management, agricultural water management including irrigation, drainage, erosion and sediment transport and design of naturalized channels. The areas of emphasis currently covered in environmental engineering are water treatment, site remediation, management of agriculture and municipal solid and liquid wastes and risk assessment. Areas of emphasis currently covered in biological engineering are food engineering, and bioprocess engineering.

Administrative Staff

Acting Director

Richard G. Zytner (2385 Thornbrough, Ext. 52430)
rzytner@uoguelph.ca

Acting Associate Director

Douglas Joy (2342 Thornbrough, Ext. 53048)
djoy@uoguelph.ca

Graduate Co-ordinator

Ralph Brown (2340 Thornbrough, Ext. 53922/56187)
rbbrown@uoguelph.ca

Graduate Secretary

(2363 Thornbrough, Ext. 56187)
soegrad@uoguelph.ca

Graduate Faculty

Hussein A. Abdullah

BSc University of Technology, MSc, Ph.D. Glasgow - Associate Professor

Shawki Areibi

BASc Al-Fateh, MASc Waterloo, Ph.D. Waterloo - Associate Professor

Andrea L. Bradford

BSc, PhD Queen's - Assistant Professor

Ralph B. Brown

BSc (Agr), BSc (Eng), MSc, PhD Guelph, PEng - Professor

Valerie J. Davidson

BEng McMaster, MSc Guelph, PhD Toronto, PEng - Professor

Robert Dony

BASc, MASc Waterloo, PhD McMaster, PEng - Assistant Professor

Khosrow Farahbakhsh

PhD Alberta, PEng - Assistant Professor

Dalia Fayek

2004-2006 University of Guelph Graduate Calendar

PhD Waterloo, PEng - Assistant Professor

Bahram Gharabaghi

BSc Iran Univ. of Science and Technology, MSc Sharif Univ. of Science and Technology, PhD Guelph - Assistant Professor

Karen D. Gordon

BSc Guelph, PhD Waterloo - Assistant Professor

Stefano Gregori

MSc, PhD Pavia (Italy) - Assistant Professor

Gordon L. Hayward

BASc, MASc, PhD Waterloo, PEng - Associate Professor

Isobel W. Heathcote

BSc Toronto, MS Yale, PhD Yale - Dean of Graduate Studies, Director of the Institute for Environmental Policy and Professor (Joint appointment with the Faculty of Environmental Sciences)

Douglas M. Joy

BASc Toronto, MASc Ottawa, PhD Waterloo, PEng - Associate Professor and Acting Associate Director

Edward McBean

PhD Massachusetts Institute of Technology, PEng - Professor

Gauri S. Mittal

BSc Punjab Agricultural, MSc Manitoba, PhD Ohio State, PEng - Professor

Medhat A. Moussa

BSc American, MASc Moncton, PhD Waterloo - Assistant Professor

Radu Muresan

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

Michele L. Oliver

BPE McMaster, MPE, MSc, PhD New Brunswick - Assistant Professor

Lambert Otten

BASc, MASc, PhD Waterloo, PEng - Professor

Ramesh P. Rudra

BSc Punjab Agricultural, MS, PhD Pennsylvania State, PEng - Professor

R. John Runciman

BSc Queen's, MSc Queen's, PhD (Strathclyde), PEng - Associate Professor

Warren Stiver

BASc, MASc, PhD Toronto, PEng - Professor

Deborah Stacey

BSc Guelph, MASc, PhD Waterloo - Associate Professor (Joint appointment with Computing and Information Science)

David A. Swayne

BSc Waterloo, MA York, PhD Waterloo - Professor (Joint appointment with Computing and Information Science)

Bill Van Heyst

BASc, MASc, PhD Waterloo - Assistant Professor

Simon X. Yang

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

Hongde Zhou

BSc Jiangsu, MSc China, PhD Alberta, PEng - Associate Professor

Richard G. Zytner

BASc, MASc, PhD Windsor, PEng - Professor and Acting Director

MSc Program

Admission Requirements

MSc by Thesis

In addition to the general admission standards of the university, the school has adopted additional admissions criteria for MSc studies. Applicants must meet one of the following requirements:

- Bachelor's degree in engineering or equivalent. At least a second class honours standing in the work of the last four full-time semesters or the last two complete undergraduate years.
- Science degree or equivalent. Applicant must be a graduate from an honours Engineering program with at least a 75% average in the past four full-time semesters or the equivalent. International degree and grade equivalents will be determined by Graduate Program Services. Applicant must have demonstrated an acceptable analytical ability by having taken a sufficient number of courses in mathematics, chemistry and physics. Applicant must be prepared to make-up undergraduate engineering courses without receiving graduate credit in topics related to the research project.

MEng Program

Applicant must be a graduate from an honours program with at least a 70% average in the past four full semesters or the last two complete undergraduate years or the equivalent. International degree and grade equivalents will be determined by Graduate Program Services.

Applicant must have demonstrated an acceptable analytical ability by having taken a sufficient number of courses in mathematics, and the physical sciences.

For the environmental engineering degree the applicant must have a minimum of three of the following courses or equivalent:

- Introduction to Environmental Engineering
- Engineering Unit Operations
- Water Quality
- Air Quality
- Solid Waste Management
- Water and Wastewater Treatment
- Ecology.

For water resources engineering the applicant must have four of the following courses or equivalent:

- Fluid Mechanics
- Water Management
- Hydrology
- Water Quality
- Urban Water Systems
- Watershed Structures
- Soil and Water Conservation

For biological engineering the applicant must have a minimum requirement of three of the following courses or equivalent.

- Biological/Food/Bioprocess Engineering
- Engineering Unit Operations
- Bioreactor Design
- Bio instrumentation Design
- Food Process Engineering Design
- Digital Process Control Design
- Heat and Mass Transfer
- Process Engineering.

Applicant qualifications may be assessed via an entrance interview/oral examination conducted by the graduate co-ordinator 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. The student will be admitted on probation until the requirements have been completed. These courses will not count toward the student's graduate credit requirements.

Degree Requirements

MSc 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, including the Engineering Seminar course and at least two other engineering 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 studies program consists of at least 5.0 credits acceptable for graduate credit. This includes 2.5 credits from the program core (see section 5.4 of 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 graduate co-ordinator, and no more than 1.5 credits will be from courses offered outside the School of Engineering. For the final project the student will make arrangements with one of the graduate faculty to act as advisor.

PhD Program

Admission Requirements

The minimum academic requirement for admission to the PhD program is normally a recognized master's degree in engineering. A strong recommendation from the MSc advisor is necessary. Direct admission to the PhD 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 graduate co-ordinator at an early 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 MSc degree. At least 1.5 of the credits must be at the graduate level, including the Engineering Seminar course and at least two graduate engineering courses. Under special circumstances the school may reduce the requirement for 1.5 credits

in graduate courses; 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.

Students who have completed their MSc degree in the School of Engineering are not required to enrol in the graduate Engineering Seminar course, and their credit requirements are reduced. 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.

Interdepartmental Programs

MSc Aquaculture Interdepartmental Program

The School of Engineering participates in the master of science in aquaculture program. Those faculty members whose research and teaching expertise includes aspects of aquaculture may serve as advisers for MSc (Aquaculture) students. Please consult the Aquaculture listing for a detailed description of the MSc (Aquaculture) interdepartmental program.

MSc Food Safety and Quality Assurance Collaborative Program

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 advisers for MSc students. Please consult the Food Safety and Quality Assurance listing for a detailed description of the MSc collaborative program.

Courses

General

ENGG*6000 Advanced Heat and Mass Transfer F [0.50]
Basic physical principles of transport phenomena. Heat and mass transfer methods for physical systems. Time and volume averaging. Dimensional analysis.
ENGG*6020 Advanced Fluid Mechanics U [0.50]
Laminar and turbulent flow. Turbulence and turbulence modelling. Boundary-layer flow. Compressible flow. Potential flow.
ENGG*6030 Finite Difference Methods W [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 W [0.50]
Boundary-value problems. Methods of approximation. Time dependent problems. Isoparametric elements. Numerical integration. Computer implementation. Mesh generation and layouts. Two-dimensional finite elements.
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 W [0.50]
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 W [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 W [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 F [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 F [0.50]
Rheology and rheological properties. Contact stresses between bodies in compression. Mechanical damage. Aerodynamic and hydro-dynamic characteristics. Friction.
ENGG*6150 Bio-Instrumentation W [0.50]
Instrumentation systems. Transducers. Amplifier circuits. Recording methods. Spectroscopy & colorimetry. Radiation, humidity, pH and noise measurements. Chromatography.
ENGG*6160 Advanced Food Engineering F [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.
ENGG*6190 Special Topics in Biological Engineering W [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*6440 Advanced Biomechanical Design F [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 W [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, radial 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 F [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 W [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 W [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 W [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*6670 Hazardous Waste Management F [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 F [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 F [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 selection of management approaches for various 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.

Engineering Systems and Computing

ENGG*6070 Medical Imaging W [0.50]
Digital image processing techniques including filtering and restoration; physics of image formation for such modalities as radiography, MRI, ultrasound. <i>Prerequisite(s):</i> ENGG*3390 or equivalent
ENGG*6100 Machine Vision F [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 W [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*6440 Advanced Biomechanical Design F [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.
ENGG*6540 Advanced Robotics W [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 W [0.50]
Soft real-time systems, hard real-time systems, embedded systems, time handling and synchronization, deadlines, preemption, interruption, rts languages, rts/operating systems, system life-cycle, petri nets, task scheduling and allocation, fault-tolerance, resource management, rts/search techniques, dealing with uncertainty.

ENGG*6560 Advanced Digital Signal Processing W [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 F [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 F [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 infinite control and uncertainty and robustness in control systems will be addressed. .

Water Resources Engineering**ENGG*6740 Ground Water Modelling W [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 W [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]

Distribution function selection for historic hydrologic data representation. Monte Carlo simulation techniques. ARMA modelling of hydrologic processes. Regional analysis. Risk analysis.

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 W [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]

Analytical decision making. Optimization methods. Planning under uncertainty. Deterministic river basin modelling. Irrigation planning and operation. Water quality management modelling.

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.

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

Acting Director

David Murray (368 MacKinnon, Ext. 53881)
dmurray@uoguelph.ca

Graduate Co-ordinator

Paul Mulholland (110 Massey, Ext. 58749)
pmulholl@uoguelph.ca

Graduate Secretary

Sharon Ballantyne (427 MacKinnon, Ext. 56315)
sballant@uoguelph.ca

Graduate Faculty

Christine Bold

MA Edinburgh, PhD University College London - Professor

Dionne Brand

BA, MA Toronto - Professor and University Research Chair

Susan I. Brown

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

Elaine Chang

BA British Columbia; AM, PhD Stanford - Assistant Professor

Michelle Elleray

BA Victoria (Wellington), MA Auckland, MA, PhD Cornell - Assistant Professor

Daniel Fischlin

BFA, MA Concordia, PhD York - Professor

Ajay Heble

BA Innis College (U. of Toronto), MA Dalhousie, PhD Toronto - Professor

Helen Hoy

BA, MA, PhD Toronto - Professor

Smaro Kamboureli

BA Aristotelian, MA, PhD Manitoba - Professor

Michael H. Keefer

BA Royal Military College, MA Toronto, DPhil Sussex - Associate Professor

Thomas King

BA, MA Chico State, PhD Utah - Professor

Janice Kulyk Keefer

BA Toronto, MA, DPhil Sussex - Professor

Martha Nandorfy

BA, MA Ottawa, PhD Toronto - Associate Professor

Daniel O'Quinn

BSc, MA Western, PhD York - Associate Professor

Tedra Osell

BA Washington, MA Nebraska, PhD Washington - Assistant Professor

Donna Palmateer Pennee

BA, MA Guelph, PhD McGill - Professor and Associate Dean of Arts and Social Sciences

Stephen Powell

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

Pablo Ramirez

BA Yale, MFA Miami, MA, PhD Michigan - Assistant Professor

Jennifer Schacker

BA McGill, MA, PhD Indiana - Associate Professor

Alan Shepard

BA St. Olaf College, PhD Virginia - Professor and Director of the School

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 year of study. Students with degrees with excellent academic records in other disciplines will also be considered, or may be allowed to do qualifying undergraduate courses at the University of Guelph prior to

beginning graduate study. Students wishing to enter the program normally do so in September. (Only under exceptional circumstances may students be considered for admission in either January or May.) Applications from international students are warmly encouraged, although the application procedures are somewhat more complex. 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. Sample minimum scores are 580 for TOEFL or 6.5 for the British Council test.

Degree Requirements

All entering MA students will register for the joint, required two-semester course, ENGL*6010 Approaches to Research and Theory. This course must be taken upon entrance, requiring that entering students be registered for both the Fall and Winter semester. Students may choose between two options for completion of remaining degree requirements:

- Course-Work Option: The required ENGL*6010 plus four other courses; plus ENGL*6803 Research Project
- Thesis Option: the required ENGL*6010 plus two other courses, plus a thesis of 20,000 to 25,000 words (80-100 pages)

Creative Writing Option: both the research paper or project and the thesis may, with approval, and contingent upon faculty availability, be completed as exercises in creative writing.

Courses

Note

With the exception of ENGL*6010, 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 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*6010 Approaches to Research and Theory U [1.00]

Introduces methodologies of graduate-level scholarship through a series of modules. Module 1 (which is required) focuses on a common text of imaginative literature, to introduce a range of theoretical and interpretative strategies and research tools. Subsequent modules (of which two are required) focus on particular issues in the study of literature and performance. NOTE: ENGL*6010 is offered over the Fall and Winter semesters and students must therefore register for the course in both Fall and Winter. They will receive an INP ("in progress") grade at the end of the Fall, and a final grade at the end of the Winter NOTE: ENGL*6010 is offered over the Fall and Winter semesters and students must therefore register for the course in both Fall and Winter. They will receive an INP ("in progress") grade at the end of the Fall, and a final grade at the end of the Winter

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 Commonwealth/Postcolonial 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]
A examination of the literature of Britain between the 17th century and the latter part of the 18th century. Topics may focus on a single author, a specific genre, or relationships between the literary and the cultural.
ENGL*6421 Topics in Eighteenth Century and Romantic Literature U [0.50]
A examination of the literature of Britain between the 17th century and the latter part of the 18th century. Topics may focus on a single author, a specific genre, or relationships between the literary and the cultural.
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.
ENGL*6451 Topics in American Literature U [0.50]
Topics may include a focus on a single region, such as the American West, on a single time period, such as the Civil War, on a specific genre, such as the novels of frontier women, or other issues in American literary studies.
ENGL*6611 Topics in Women's Writing U [0.50]
In the past the course has dealt with Victorian women poets, with the place of women in the literature of the American West, and with other issues of interest to students of women's writing and the broader issues of feminist theory.
ENGL*6621 Topics in Children's Literature U [0.50]
Past offerings have involved a focus on a specific author - such as Lucy Maud Montgomery - or on a specific kind of writing for or by children.
ENGL*6641 Topics in Scottish Literature U [0.50]
Courses under this rubric are concerned with the various literatures produced by Scots both within and beyond the boundaries of Scotland. The course could involve the study of a specific genre, the investigation of a specific theme, or the examination of a particular author over the course of her/his career.
ENGL*6691 Interdisciplinary Studies U [0.50]
Designed to provide the opportunity to explore alternative fields and modes of critical inquiry, this variable-content course will study the relationship between literary study and other forms of intellectual inquiry such as the relationship between literature and sociology, between critical theory and psychology, between literary history and historical fact.
ENGL*6801 Reading Course I U [0.50]
An independent study course, the nature and content of which is agreed upon between the individual student and the person offering the course. Subject to the approval of the student's advisory committee and the graduate committee.
ENGL*6802 Reading Course II U [0.50]
An independent study course, the nature and content of which is agreed upon between the individual student and the person offering the course. Subject to the approval of the student's advisory committee and the graduate committee.
ENGL*6803 Research Project U [1.00]
An independent study course, the content of which is agreed upon between the individual student and the person offering the course. Subject to the approval of the student's advisory committee and the Graduate 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.
ENGL*6811 Special Topics in English U [0.50]
Depending on the research interests of the instructor, courses under this rubric explore topics in the study of literature that do not fall neatly under the rubrics above. In the past the course has dealt with literature and aging, and with issues in the field of popular culture.

Environmental Biology

The Department of Environmental Biology offers programs of study leading to MSc and PhD degrees. Graduate studies in this department are designed to train people to work independently and imaginatively with a high level of technical skill and scientific acumen in various areas of environmental biology.

Administrative Staff

Chair

Michael Dixon (1106 Bovey, Ext. 52555)
mdixon@uoguelph.ca

Associate Chair

L. Ritter (2114 Bovey, Ext. 52980)
lritter@uoguelph.ca

Acting Graduate Co-ordinator

Paul Goodwin (3239 Bovey, Ext. 52574)
pgoodwin@uoguelph.ca

Graduate Secretary

Joy Roberts (1102 Bovey, Ext. 53937)
joyrober@uoguelph.ca

Graduate Faculty

Greg J. Boland

BSc, MSc Acadia, PhD Guelph - Professor

Michael A. Dixon

BSc, MSc Mount Allison, PhD Edinburgh - Professor and Chair

Paul H. Goodwin

BS Villanova, MSc Minnesota, PhD California (Davis) - Associate Professor

Andrew M. Gordon

BScF New Brunswick, PhD Alaska - Professor

Ernesto Guzman

DVM Mexico, MSc, PhD California (Davis) - Associate Professor

J. Christopher Hall

BSc, MSc Guelph, PhD Alberta - Professor

Rebecca Hallett

BSc Toronto, MPM, PhD Simon Fraser - Assistant Professor

Thomas Hsiang

BSc, MSc British Columbia, PhD Washington - Professor

Peter G. Kevan

BSc McGill, PhD Alberta - Professor

Hung Lee

BSc British Columbia, PhD McGill - Professor

Steven A. Marshall

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

Jonathan A. Newman

BA, PhD State Univ. of New York - Associate Professor

Gard W. Otis

BS Duke, PhD Kansas - Associate Professor

Leonard Ritter

BSc, MSc Montreal, PhD Queen's - Professor

Jonathan M. Schmidt

BSc, PhD Toronto - Associate Professor

Cynthia D. Scott-Dupree

BSc Brandon, MPM, PhD Simon Fraser - Associate Professor

Mark K. Sears

BS, PhD California - Professor

Paul K. Sibley

BSc, MSc Guelph, PhD Waterloo - Assistant Professor

Keith R. Solomon

BSc, MSc Rhodes, PhD Illinois - Professor

Jack T. Trevors

BSc, MSc Acadia, PhD Waterloo - Professor

MSc Program

The MSc program has five areas of specialization: entomology, environmental microbiology and biotechnology, environmental toxicology, plant and forest systems and plant pathology.

- Entomology emphasizes applied aspects of insect pest management plus systematics, ecology, physiology, and toxicology.
- Environmental microbiology and biotechnology emphasizes the physiology, ecology, biochemistry and genetics of microorganisms with potential for environmental or biotechnological applications. It also includes studies on microbial pathogen detection and monitoring in the environment.

- Environmental toxicology examines how terrestrial and aquatic organisms interact with toxic compounds in the environment, describes the methods and tools needed to assess environmental impacts, and emphasizes practical management solutions to address environmental problems.
- Plant and forest systems examines the ecological interactions in forest ecosystems and controlled environments such as greenhouses, growth chambers and life support systems for humans in space. Emphasis is placed on carbon dynamics, nutrient cycling, ecological modeling, environment sensor technology, atmosphere management (eg. "sick building syndrome") and environmental remediation.
- Plant pathology emphasizes the ecology and genetics of plant pathogens, plant disease resistance and epidemiology, the genomics and molecular biology of plant-pathogen interactions, and the development of new plant disease management strategies, such as the use of chemical, cultural and biological control agents.

Admission Requirements

Normally, applicants must hold a bachelor's degree with high second-class honours standing or better in a field appropriate to their proposed area of study. Interested students from other disciplines may also be acceptable, subject to the decision of the department graduate admissions committee.

Degree Requirements

A candidate for the MSc degree is expected to have a general knowledge of fundamental aspects of biology and detailed knowledge of the specialty area. The specialty area will normally be one of the areas in which the Department of Environmental Biology is prepared to offer a graduate degree. In addition, students are encouraged to obtain a knowledge of both theoretical and applied aspects of their specialty area.

Before the end of the student's first semester, the advisory committee will meet informally with the student to discuss the student's background, interests and knowledge in the proposed research area. The advisory committee will then establish a program of prescribed courses (at least 1.5 credits of graduate level courses) and, if required, additional courses. All MSc candidates must complete a thesis. A statement of the objectives of the thesis research program should be prepared as early as possible.

A normal MSc program requires six semesters. Programs involving field work may require seven or eight semesters. The number of courses per semester should not normally exceed four. Among these would be courses that are core requirements of the undergraduate specialty and represent the candidate's deficiencies.

Graduate students must take both the Introductory Seminar, ENVB*6710, and the Advanced Seminar, ENVB*6720, unless exempted from taking the Introductory Seminar by the advisory committee.

PhD Program

The PhD program emphasizes the same major areas of specialization as the MSc program.

Admission Requirements

Normally applicants should have attained a master's degree with high second-class honours standing or better in a field appropriate to their proposed area of study. Under exceptional circumstances, as noted in the Graduate Calendar, students may be permitted to transfer from an MSc to a PhD program without completing the master's degree. Interested students from other disciplines may also be acceptable subject to the decision of the department graduate admissions committee.

Degree Requirements

A candidate for the PhD degree is expected to have a general knowledge of fundamental aspects of biology and detailed knowledge of the specialty area. The specialty area will normally be one of the areas in which the Department of Environmental Biology is prepared to offer a graduate degree. In addition, students are encouraged to obtain a knowledge of both the theoretical and applied aspects of their specialty area.

Before the end of the student's first semester the advisory committee will meet informally with the student to discuss the student's background, interests and knowledge in the proposed research area. The advisory committee will then establish a program of prescribed courses and, if necessary, additional courses.

All PhD candidates must complete a thesis. A statement of the objectives of the thesis research program should be prepared as early as possible. A PhD program normally requires 9 to 11 semesters. The number of courses per semester should not normally exceed four. Graduate students must take the Advanced Seminar, ENVB*6720, and may be required by their advisory committee to take the Introductory Seminar, ENVB*6710.

Interdepartmental Programs

Toxicology MSc/PhD Collaborative Program

The Department of Environmental Biology participates in the MSc/PhD program in toxicology. Professors Hall, Kevan, Lee, Ritter, Scott-Dupree, Sibley, Solomon, and Trevors are members of the Toxicology Interdepartmental Group. The faculty members' research and teaching expertise includes aspects of toxicology; they may serve as advisers for MSc and PhD students.

Please consult the Toxicology listing for a detailed description of the MSc/PhD collaborative program.

Courses**ENVB*6040 Molecular Basis of Plant-Microbe Interactions F [0.50]**

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.

ENVB*6060 Topics in Phytopathology W [0.50]

Current topics and emerging issues in phytopathology and plant health will be examined through presentations, discussions and group projects. Emphasis will be placed on ecology, population biology and genetics of plant pathogens and other microorganisms, and their application to current practices in plant health.

ENVB*6080 Plant Disease Epidemiology and Management W [0.50]

Epidemiology and management of plant diseases caused by fungi, viruses, and bacteria. (Offered in alternate years.)

ENVB*6180 Physiology and Biochemistry of Herbicides W [0.50]

Chemical and biological fate of herbicides in soil. Physical, morphological and physiological factors influencing herbicidal selectivity and modes of action. (Offered in alternate years.) Department of Environmental Biology

ENVB*6190 Environmental Microbial Technology W [0.50]

Current topics in selected areas of environmental microbial technology. An emphasis will be placed on the physiology and genetics of microorganisms useful in environmental biotechnology. The course involves extensive use of current journal articles.

Restriction(s): Undergraduate degree in microbiology or related discipline.

ENVB*6340 Colloquium in Insect Systematics W [0.25]

Weekly discussions and seminars dealing with current topics in systematic entomology.

ENVB*6370 Physiology of Insects F [0.50]

Students will be assigned a library exercise and will select a laboratory project in their own area of interest. Emphasis will be placed on techniques and familiarity with current literature.

ENVB*6451 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: plant protection and environmental management. This course may be offered in any of lecture, reading/seminar, or individual project formats.

ENVB*6452 Topics in Environmental Biology F,W,S [0.50]

See ENVB*6451 above.

ENVB*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.)

ENVB*6530 Ecotoxicological Risk Characterization W [0.50]

A biologically based advanced course that will give students working knowledge of current procedures and techniques for ecotoxicological risk characterization. The course material will cover the topics: problem definition, dose response characterization, exposure characterization, and risk assessment and risk-management decision making. (Credit may be obtained for only one of TOX6530, ENVB6530 and TOX4550.) Department of Environmental Biology

ENVB*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.

ENVB*6550 Bioactivity and Metabolism of Pesticides W [0.50]

The basis 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).

ENVB*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.

ENVB*6620 Management and Biology of the Honey Bee F [0.50]

An in-depth treatment of advanced topics related to honey bees, including management techniques such as wintering bees, queen rearing and instrumental insemination, comb-honey production, genetics and breeding of honey bees, caste determination, and social behaviour of honey bees. Discussion sections will focus on recent research.

ENVB*6710 Introductory Seminar F [0.25]

This course provides information and training in various scientific presentation styles - written, computer generated, oral, and poster formats. Students will prepare a scientific essay based on research they have conducted and subsequently transform the essay into an oral and a poster format.

ENVB*6720 Advanced Seminar W [0.25]

Graduate students will prepare either an oral or a poster presentation on their thesis research. They will also be responsible for participating in the organization of a departmental graduate student symposium during which their presentations will be given and evaluated. Students must also attend weekly departmental seminars and prepare 5 precis for evaluation.

Family Relations and Applied Nutrition

The Department of Family Relations and Applied Nutrition offers MSc and PhD level graduate study in two fields: i) applied human nutrition and ii) family relations and human development. An accredited MSc program in couple and family therapy and a Master of Applied Nutrition professional program are also offered. The multidisciplinary faculty in the department have expertise in psychology, sociology, education, social work, family therapy and nutrition. 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 animal nutrition are available in the Department of Animal and Poultry Science and with an emphasis on metabolism in the Department of Human Health and Nutritional Sciences.

Administrative Staff

Chair

Kerry Daly (245 MINS, Ext. 56326)

Graduate Co-ordinator

Leon Kuczynski (233 MINS, Ext. 52421)

Graduate Administrative Assistant

Margo Shoemaker (225 MINS, Ext. 53582)

Graduate Secretary

Joanne Waechter (249 MINS, Ext. 53968)

frangs@uoguelph.ca

Graduate Faculty

Gerald R. Adams

BS Midland Lutheran College, MA Nebraska, PhD Pennsylvania State - Professor

John M. Beaton

BA Wilfrid Laurier, MDiv Tyndale Theological Seminary, MSc Guelph, PhD Minnesota - Assistant Professor

Paula M. Brauer

BHE British Columbia, MS Wisconsin, PhD Toronto - Assistant Professor

Kathleen M. Brophy

BSc McGill, MS, PhD Illinois - Professor

Andrea Buchholz

BAA Ryerson, MSc Guelph, PhD Toronto - Assistant Professor

Kerry Daly

BA Carleton, MSc Guelph, PhD McMaster - Professor and Chair

Anna Dienhart

BA City Univ. of New York, MS UCLA, MSc, PhD Guelph - Associate Professor

John Dwyer

BA Western, BEd Memorial, MA Western, PhD Saskatchewan - Assistant Professor

Susan Evers

BSc Ottawa, MS Cornell, PhD Western Ontario - Professor

Edward S. Herold

BA, MA Manitoba, PhD Iowa State - Professor Emeritus

Heather Keller

BA Sc Guelph, MSc McGill, PhD Western Ontario - Associate Professor

Leon Kuczynski

BSc, MA, PhD Toronto - Professor

Donna S. Lero

BA State U. of New York, MS, PhD Purdue - Associate Professor

Susan P. Lollis

BSc, MSc California, PhD Waterloo - Professor

Clare MacMartin

BSc, MA Toronto, PhD Guelph - Assistant Professor

Scott Maitland

BSc State Univ of New York, MSc, PhD Pennsylvania State - Associate Professor

Joan E.A. Norris

BA, MA, PhD Waterloo - Professor, and Associate Dean, Faculty of Graduate Studies

Bruce A. Ryan

BA, MEd, PhD Alberta - Professor Emeritus

Janis Randall Simpson

BSc Toronto, PhD Guelph - Assistant Professor

Judy D. Sheeshka

BHE British Columbia, PhD Guelph - Associate Professor

Joseph A. Tindale

BA, MA McMaster, PhD York - Professor

Carolyn Y. Tubbs

BA, MS Texas Tech, PhD Purdue - Assistant Professor

Jean E. Turner

Teacher's Cert. British Columbia, BSc Cornell, MA, PhD York - Associate Professor

MSc Program

Applied Human Nutrition

The MSc program in 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. Special attention is given to therapeutic and community nutrition, nutrition education, and nutritional epidemiology. The MSc program normally requires two years of study.

Family Relations and Human Development

The MSc program in family relations and human development draws on several disciplines in the study of family dynamics and individual development within the context of the family across the life-cycle. The program promotes a broad and sophisticated understanding of human development and family functioning and supports students' specialization in an area of emphasis. Current areas of emphasis in research are:

- Child and adolescent development - parent-child relationships, peer relationships, early childhood services, program development and evaluation,
- adult development and family relations - intergenerational relations, alternate family structures, human sexuality, gerontology

Couple and Family Therapy

The MSc program in couple and family therapy is a program 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 program 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 individuals, couples, and families. This integration is coupled with high standards of professional and ethical conduct, attention to broader social issues impacting on couples and families, and an emphasis on issues of diversity and gender (both men's and women's experience).

Admission Requirements

General admission requirements for these programs include an honours degree or equivalent with at least a 'B+' average in the last two years.

Applied Human Nutrition

Admission requirements for the MSc program in 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) one half-course in applied statistics; 2) one half-course in research methods; 3) two half-courses in biochemistry; 4) two half-courses in human physiology (at or beyond the second-year level); 5) two half-courses in human development/sociology/psychology/communications; 6) one 300-level and three 400-level half-courses in human nutrition. These requirements may be in progress at the time of application. The deadline for application is February 1 of each year.

Family Relations and Human Development

Admission requirements for the MSc program in 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) one half-course in applied statistics; 2) one half-course in one of social-science research methods; 3) one half-course in human development, child development, gerontology, parent-child relations; 4) one half-course in family sociology, social psychology, in one of family relations, family theory, communications; 5) three 400-level (senior, fourth year) half-courses. The deadline for application is February 1 of each year.

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). Beyond this, a personal statement discussing your motivation for Couple and Family Therapy graduate education; a statement of intent and a statement of research interest must be included with the application. Relevant work or volunteer experience is an asset. 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 in mid-February with the couple and family therapy faculty. Participation in the interview is required for admission. Prior to beginning the program admitted students must submit a current police check (CPIC - Canadian Police Information Centre) from their local police. Applications from outside of Canada are welcome and external interviewing appropriately explored. The deadline for application is January 10 of each year.

Degree Requirements

Applied Human Nutrition

For all students in the MSc program in applied human nutrition a minimum of seven graduate courses will be chosen in consultation with the student's adviser and advisory committee including:

FRAN*6030	Quantitative Research Methods
FRAN*6040	Introduction to Qualitative Methods
FRAN*6420	Introductory Applied Statistics
FRAN*6430	Advanced Applied Statistics I
OR	
FRAN*6050	Qualitative Analysis
FRAN*6510	Nutrition in the Community
FRAN*6610	Advances in Clinical Nutrition/Assessment I
FRAN*6550	Research Seminar

In addition, students must complete a research thesis. The courses and research may emphasize, for example, community nutrition, therapeutic nutrition, and nutritional epidemiology. The courses may be taken within the department and in other academic units of the university including Agricultural Economics and Business, Biomedical Sciences, Human Health and Nutritional Sciences, Political Science, Population Medicine, Rural Extension Studies, Sociology and Anthropology, and Rural Planning and Development.

Family Relations and Human Development

For all students in the MSc program in family relations and human development there are six required graduate courses:

FRAN*6030	Quantitative Research Methods
FRAN*6040	Introduction to Qualitative Methods
FRAN*6420	Introductory Applied Statistics
FRAN*6430	Advanced Applied Statistics I
OR	
FRAN*6050	Qualitative Analysis
FRAN*6340	Interdisciplinary Perspectives in FRHD
FRAN*6330	Research Seminar

In addition, most students take two to four additional graduate courses related to their program of study and complete a research thesis. The student's choice of 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 includes areas of research that reflect current faculty interests and is intended to help students define an area of research and study.

Couple and Family Therapy

Beyond the required courses noted in the above section on the MSc in family relations and human development, students in the Couple and Family Therapy program are required to take several additional courses. The intensive curriculum has been designed to enable students to achieve an integration of theory, practice and research. The program is guided by a systemic perspective, with emphasis on narrative, solution oriented and dialogic approaches. Students are encouraged to attain the best fit between established approaches and a personalized therapy style. Attention to issues of gender, race, class, ethnicity, sexual identity and culture as well as experiences of oppression and abuse are infused throughout all aspects of the program.

Students are expected to develop competence in research. Students may choose to write a thesis and thus conduct a research study or they may choose the major research paper (non-thesis) option.

Clinical training consists of four continuous practica (FRAN*6090) within the Couple and Family Therapy Centre, plus an externship in a community agency. 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 sessions; supervision modalities include live supervision, live 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).

In addition to the required courses for the MSc in family relations and human development and the five practica, students in the Couple and Family Therapy program are required to take:

FRAN*6080	Special Topics in Couple and Family Therapy
FRAN*6100	Clinical Issues in Couple and Family Therapy I, II, III, IV
FRAN*6120	Theories and Methods of Family Therapy I
FRAN*6130	Theories and Methods of Family Therapy II
FRAN*6140	Professional Issues
FRAN*6160	Facilitation in Family Functioning
FRAN*6180	Research in Couple and Family Assessment and Intervention

One elective in individual and family development across the lifespan.

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 Applied Nutrition: Couple and Family Therapy.

MAN Program

The MAN program comprises one year (3 semesters) of advanced professional course work and competency-based practice experience. The program is designed to meet the professional practice requirements for becoming a registered dietitian. Graduates will complete the entry-level competencies of Dietitians of Canada (DC). Completion of the competencies will qualify a graduate to write the registration examination to become a member of the College of Dietitians of Ontario (CDO), or an other 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 from a dietetic program accredited by Dietitians of Canada. Applicants should have a minimum average of at least B+ in the last two years of their undergraduate program. Credit in the following courses is required prior to beginning the program: 1) one half-course in applied statistics and 2) one half-course in research methods. These requirements may be in progress at the time of application.

All applications will be reviewed by a committee of Applied Human Nutrition graduate faculty. The AHN faculty will interview the most qualified applicants, rank the candidates and forward recommendations to the Dean of Graduate Studies. The deadline for application is February 1 of each year.

Degree Requirements

Students in the Masters of Applied Nutrition program will take the following courses:

FRAN*6510	Nutrition in the Community;
FRAN*6610	Advances in Clinical/Nutritional Assessment;
	one of selected graduate courses from the Faculty of Management, based on course content, prerequisites and availability;
	and
FRAN*6710	Practicum in Applied Human Nutrition I
FRAN*6720	Practicum in Applied Human Nutrition II
FRAN*6730	Practicum in Applied Human Nutrition III
FRAN*6750	Final Project in Applied Human Nutrition

Graduates who have completed all required competencies successfully can apply to write the examination and qualify as a member of the College of Dietitians of Ontario (CDO).

PhD Program

Applied Human Nutrition

The PhD Program in applied human nutrition is a three-year program with a strong research focus involving biological and/or social-science perspectives. 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 family relations and human development is a three-year program with a strong research focus. Areas of research emphasis are: 1) Child and adolescent development (socialization processes, parent-child relationships, peer relationships, early childhood services, program development and evaluation), and 2) Adult development and family relations (family socialization, intergenerational relations, alternate family structures, human sexuality, gerontology). 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.

Admission Requirements

Applied Human Nutrition

Students applying to the PhD program in applied human nutrition should have an MSc degree in human nutrition or a closely related field. 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 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). A master's thesis is normally required for admission.

Students enrolled in the MSc program are not automatically considered for the PhD program; a formal application is required for those wishing admission. Applications are evaluated with reference to academic, research, and professional experience with particular emphasis on research background and potential.

Degree Requirements

Applied Human Nutrition

PhD students in applied human nutrition are required to take a minimum of eleven courses that build a foundation for their research and/or practice:

FRAN*6030	Quantitative Research Methods
FRAN*6040	Introduction to Qualitative Methods
FRAN*6050	Qualitative Analysis
FRAN*6420	Introductory Applied Statistics
FRAN*6430	Advanced Applied Statistics I
FRAN*6440	Advanced Applied Statistics II
FRAN*6510	Nutrition in the Community
FRAN*6610	Advances in Clinical Nutrition/Assessment I
FRAN*6620	Nutritional Epidemiology
FRAN*6630	Advances in Clinical Nutrition/Assessment II
FRAN*6550	Research Seminar

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 choice of emphasis is primarily determined by research specialization and selection of elective courses. 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 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 nine courses (if not completed previously):

FRAN*6030	Quantitative Research Methods
FRAN*6040	Introduction to Qualitative Methods
FRAN*6050	Qualitative Analysis
FRAN*6420	Introductory Applied Statistics
FRAN*6430	Advanced Applied Statistics I
FRAN*6440	Advanced Applied Statistics II
FRAN*6340	Interdisciplinary Perspectives in FRHD
FRAN*6280	Theorizing in FRHD
FRAN*6330	Research Seminar

The student's choice of emphasis is primarily determined by research specialization and by selection of elective courses. 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.

Reference check

According to recent Ontario legislation, agencies licensed by the Ministry of Community and Social Services which care for, or provide service to, children or vulnerable adults are required to do criminal reference checks on all their employees. Students enrolled in practica or field placement courses, in some instances, may 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 (Canadian police information check) will be the responsibility of each student. Applicants to the Couple and Family Therapy Program must submit the results of this check to the Department of Family Relations and Applied Nutrition at the time of their interview.

Courses

Applied Human Nutrition

FRAN*6510 Nutrition in the Community U [0.50]
Concepts and knowledge of nutrition as applied in community and public health nutrition. Examination of current programs in applied nutrition.
FRAN*6550 Research Seminar U [0.25]
Research literature in applied nutrition.
FRAN*6560 Special Topics in Applied Human Nutrition U [0.50]
FRAN*6600 Theoretical Perspectives in Applied Human Nutrition U [0.50]
A survey and critical analysis of theoretical frameworks from Education and the Social Sciences as they are applied to the study and understanding of human nutrition behaviour. Research issues and applications are emphasized.
FRAN*6610 Advances in Clinical Nutrition/Assessment I U [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.

FRAN*6620 Nutritional Epidemiology U [0.50]
An investigation of selected non-communicable diseases. The emphasis is on epidemiologic methods and identification of nutritional risk factors.
FRAN*6630 Advances in Clinical Nutrition/Assessment II U [0.50]
Nutritional assessment issues specific to research will be discussed in depth. Selected clinical epidemiological and health service research methodologies, including meta-analysis, will be reviewed and applied to selected emerging issues in clinical nutrition practice. <i>Prerequisite(s):</i> FRAN*6610
FRAN*6710 Practicum in Applied Human Nutrition I U [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. <i>Restriction(s):</i> For MAN students only.
FRAN*6720 Practicum in Applied Human Nutrition II U [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 <i>Prerequisite(s):</i> FRAN*6710 <i>Restriction(s):</i> For MAN students only.
FRAN*6730 Practicum in Applied Human Nutrition III U [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. <i>Prerequisite(s):</i> FRAN*6720 <i>Restriction(s):</i> For MAN students only.
FRAN*6750 Final Project in Applied Human Nutrition U [0.50]
This project (usually related to an activity during the Practicum in Applied Human Nutrition) consists of a written report of an applied research project in dietetic practice or a proposal for a research project, including literature review, purpose, methodology, and analysis and analysis plan. <i>Restriction(s):</i> For MAN students only.

Family Relations and Human Development

FRAN*6030 Quantitative Research Methods U [0.25]
This module focuses on how to critically appraise the quantitative research literature and design and applied quantitative study. The module examines the logic and steps involved in conducting research, research ethics, measurement issues, survey design, experimental and quasi-experimental designs, cross-sectional and longitudinal designs, and sampling <i>Restriction(s):</i> Available only to FRAN graduate students
FRAN*6040 Introduction to Qualitative Methods U [0.25]
This module focuses on the design of a qualitative research project with attention given to theory-method linkages, researcher roles and data collection methods. <i>Restriction(s):</i> Available only to FRAN graduate students
FRAN*6050 Qualitative Analysis U [0.25]
This module focuses on analysis procedures when working with qualitative data. Attention will be given to different forms of analysis, use of analytic memos, theoretical sampling and generating theory. Instructor's signature required.
FRAN*6070 Sexual Issues and Clinical Interventions Across the Life Span U [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. <i>Restriction(s):</i> Signature required.
FRAN*6200 Research Topics in Family Relations and Human Development U [0.50]
Contemporary research in family relations and human development. <i>Restriction(s):</i> Available only to FRAN graduate students.
FRAN*6210 Program Evaluation in Child and Family Services 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. Group involvement in an actual program evaluation is a requirement for the course.
FRAN*6220 Family, Interpersonal and Social Issues in Mid and Later Life U [0.50]
This course examines conceptual, methodological and policy issues involving inter- and intra-generational family and social relationships throughout mid and later life.

FRAN*6221 Concepts and Strategies of Primary Prevention U [0.50]

The course explores selected concepts and strategies of primary prevention. Students examine research and current practice related to individual and family health and well-being, including education, community organization, competency promotion, natural care giving, and consultation.

FRAN*6260 Practicum U [0.50]

Supervised practicum experience in a variety of agencies or services. 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.

FRAN*6270 Issues in Family-Related Social Policy U [0.50]

This course investigates definitions of social policy, comparative family-related social policy, selected issues in Canadian family policy and frameworks for analysis of social policy. Issues in policy-related research are also explored.

FRAN*6280 Theorizing in Family Relations and Human Development U [0.50]

An examination of the meaning of science and theory in relation to the study of families and human development. Included is a discussion of the major social science paradigms including positivism, critical theory, social constructionism and post-modernity. This course is designed for doctoral students.

FRAN*6300 Theories of Development and Change Across the Life Span U [0.50]

An interdisciplinary examination of sociological and psychological theories of development and change across the life span. Critical comparisons among theories with competing assumptions at different points over individual and family life cycles is discussed.

FRAN*6310 Parent-Child Relations Across the Life Span U [0.50]

Considers theory and research on parent-child interactions, relationships and intergenerational transmission across the life span. (Offered in alternate years.)

FRAN*6320 Human Sexuality Across the Life Span U [0.50]

This course covers research, theoretical and substantive issues relevant to studying human sexuality across the life span. Topics include: child and adolescent sexuality, sexual identity, sexuality in adulthood and old age, sexual assault, international research and sex education.

FRAN*6330 Research Seminar U [0.25]

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.

FRAN*6340 Interdisciplinary Perspectives in Family Relations and Human Development U [0.50]

This course acquaints students with the diverse disciplinary perspectives used in the study of family relations and human development. Substantive research issues provide a forum for integrating the separate perspectives and understanding the reciprocal relationship between individual and family growth and development.

FRAN*6370 Social Development During Childhood U [0.50]

A detailed study of factors important to social competence in childhood from infancy to adolescence.

FRAN*6380 Adolescence U [0.50]

Adolescence is examined from a multidisciplinary developmental-contextualist perspective. Topics include: individual differences, development, and social and environmental contributions to adolescent psychosocial functioning.

FRAN*6410 Developmental Assessment and Intervention in Childhood and Adolescence U [0.50]

An examination of psychological difficulties encountered in childhood and adolescence. Special attention will be given to theoretical models used to explain childhood difficulties, categorization systems, assessment techniques, methods of intervention, as well as ethical issues specific to working with children and adolescence.

FRAN*6420 Introductory Applied Statistics U [0.25]

Background theory and knowledge components required to understand introductory parametric and non-parametric statistics appropriate in applied social/health science research. Students will learn conceptual and practical applications of statistical analyses with emphasis on hypothesis formation, data screening and description analysis and interpretation.

Restriction(s): Available only to FRAN graduate students

FRAN*6430 Advanced Applied Statistics I: Regression & Multivariate ANOVA Designs U [0.25]

Introduction to advanced regression modelling strategies, logistic regression analysis, multivariate analysis of variance/covariance, and repeated measures analysis of variance/covariance models appropriate in applied social/health science research. The course covers conceptual and practical applications of statistical analyses with emphasis on selection of appropriate methods and models to address complex, multi-factorial data.

Restriction(s): Available only to FRAN graduate students

FRAN*6440 Advanced Applied Statistics II: Factor Analysis U [0.25]

A theoretical and computational introduction to factor analysis as a method for understanding complex multivariate data in applied social/health science research. Principal components analysis (PCA), exploratory factor analysis (EFA), confirmatory factor analysis (CFA), and applications of structural equation modeling (SEM) will be examined. Additional topics may include scale development, multi-group analysis, and methods/concerns about measurement invariance.

Restriction(s): Available only to FRAN graduate students

FRAN*6450 Cultural Perspectives on the Family U [0.50]

Family relationships throughout the life span are considered drawing from the perspectives of cross-cultural psychology, cultural psychology and acculturation and diversity. Topics include the cultural context of family forms, dating and marriage, childrearing, socialization, and marital relations, parent-child relationships and intergenerational relationships.

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 each time the courses are offered 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 year to year.

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 U [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.

Prerequisite(s): FRAN*6090

Restriction(s): Available only to students in the Couple and Family Therapy program

FRAN*6100 Clinical Issues in Couple and Family Therapy U [0.50]

This course features selected clinical issues each semester; examination of each issue will include the socio-cultural context, theoretical location, and conceptual and practical implications for couple and family therapy.

Co-requisite(s): FRAN*6090

Restriction(s): Available only to students in the Couple and Family Therapy program

FRAN*6120 Theories and Methods of Family Therapy I U [0.50]

This course will offer an historical perspective on the development of the field of couple and family therapy beginning with family systems therapy, through intergenerational models, to current constructionist approaches. Intervention methods consistent with these conceptual frameworks are examined.

FRAN*6130 Theories and Methods of Family Therapy II U [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.

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 Facilitation in Family Functioning U [0.50]

A systemic exploration of family processes to understand diversity in family structures and functioning. This course has an applied focus on developing basic facilitation, communication and observational skills for exploring family structure and functioning. Students participate in learning groups supporting the development of these skills.

FRAN*6180 Research in Couple and Family Assessment and Intervention W [0.50]

The focus of this course is on research, assessment and intervention with couples and families across the lifespan.

Restriction(s): 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.

Fine Art

Administrative Staff

Director

John D. Kissick (203 Zavitz Hall, Ext. 56930)
jkissick@uoguelph.ca

Graduate Co-ordinator

Will Gorlitz (414 Zavitz Hall, Ext. 53224)
wgorlitz@uoguelph.ca

Graduate Secretary

Patricia MacPherson (204 Zavitz Hall, Ext. 53988)
plaw@uoguelph.ca

Graduate Faculty

James Carl

BFA Victoria, Dip. Beijing, McGill, MFA Rutgers - Assistant Professor

Susan Dobson

International BA Lester B. Pearson College of the Pacific, BAA Ryerson, MFA Guelph - Assistant Professor

Robert Enright

BA Saskatchewan - Professor

Will Gorlitz

BFA Nova Scotia College of Art & Design - Professor

James Harley

BMus Western Washington, DMus McGill - Assistant Professor

John D. Kissick

BFA Queen's, MFA Cornell, MDP Harvard Graduate School of Education - Professor and Director

Kim Kozzi (FASTWÜRMS)

AOCA Ontario College of Art - Associate Professor

Suzanne M. Lake

MFA Concordia - Professor

Jean Maddison

Dip. AD Coventry College of Art England, MFA Royal College of Art - Assistant Professor

John Potvin

BA Alberta, MA Carleton, PhD Queen's - Assistant Professor

Ben Reeves

BFA British Columbia, MFA Chelsea College of Art and Design - Assistant Professor

Dai Skuse (FASTWÜRMS)

BFA Queen's - Associate Professor

Monica Tap

BFA, MFA Nova Scotia College of Art & Design - Associate Professor

Laurel Woodcock

BFA Concordia, MFA Nova Scotia College of Art & Design - Associate Professor

Additional Faculty in Art History

Susan Douglas

BA Western, MA Carleton, PhD Concordia - Assistant Professor

Dominic Marner

BA Regina, MA Victoria, PhD East Anglia, Norwich UK - Assistant 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 photographic slides or 20 JPEG images or 10 minutes DVD.
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 Dean 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 aesthetic, historical, theoretical and technical issues pertinent to their artwork. The submitted studio work must demonstrate a professional level of competence and a significant aesthetic investigation, as approved by the candidate's master's examination committee.

The Master's Examination

At the time of the exhibition, the MFA candidate will be expected to successfully complete a final oral examination devoted chiefly to the MFA exhibition with reference to the supporting critical paper. This is a school examination identified as the master's examination.

School Regulations.

In addition to meeting the university's MFA regulations regarding thesis format, the candidate must submit appropriate visual documentation of the MFA exhibition as well as the supporting critical paper to the director of the School of Fine Art and Music for inclusion in the school's archives.

Courses

FINA*6510 Introduction to Graduate Studio F [1.50]

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.

FINA*6515 MFA Studio I W [1.50]

Sustained work at an independent level under the supervision of the chair of the student's advisory committee.

Prerequisite(s): FINA*6510.

FINA*6530 MFA Teaching Practicum I F [0.50]
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.
FINA*6531 MFA Teaching Practicum II F [0.50]
Continuation of teaching practicum under the guidance of a faculty member. The practicum seminar will consider theoretical and practical issues relevant to the teaching of studio art such as educational goals, course and curriculum planning, academic evaluation, health and safety policies, and appropriate materials and equipment. <i>Prerequisite(s):</i> FINA*6530
FINA*6540 MFA Seminar I F [0.50]
Examination of critical issues in the visual arts relevant to studio practice
FINA*6545 MFA Seminar II W [0.50]
Continuation of issues examined in FINA*6540. <i>Prerequisite(s):</i> FINA*6540.
FINA*6551 Seminar in Art Theory and Criticism I W [0.50]
Selected topics in art theory and criticism with particular relevance to studio practice. <i>Prerequisite(s):</i> Admission to MFA program or permission of instructor.
FINA*6610 MFA Studio II F [1.50]
Continuation of FINA*6515 <i>Prerequisite(s):</i> FINA*6515
FINA*6615 MFA Studio III W [1.50]
Continuation of FINA*6610 <i>Prerequisite(s):</i> FINA*6610
FINA*6640 MFA Seminar III F [0.50]
Continuation of FINA*6545 <i>Prerequisite(s):</i> FINA*6545
FINA*6641 MFA Seminar IV W [0.50]
Continuation of FINA*6640.
FINA*6652 Individual Study in Art Theory and Criticism W [0.50]
Students will pursue special study under the guidance of a faculty member with appropriate expertise. <i>Prerequisite(s):</i> Approval of the co-ordinator of the MFA program.
Additional and Elective Courses
FINA*6550 Selected Topics in Fine Art U [0.50]
Seminar in a fine art topic in a subject to be specified by the instructor. <i>Prerequisite(s):</i> Admission to the MFA program.
FINA*6552 Seminar in Canadian Art U [0.50]
Selected topics in Canadian Art <i>Prerequisite(s):</i> Admission to the MFA program and permission of instructor.
FINA*6554 Seminar in Nineteenth Century Art U [0.50]
Selected topics of the period. <i>Prerequisite(s):</i> Admission to the MFA program and permission of instructor.
FINA*6555 Seminar in Twentieth Century Art U [0.50]
Selected topics of the period. <i>Prerequisite(s):</i> Admission to MFA program and permission of instructor.
FINA*6650 Individual Study in Art History U [0.50]
Students will pursue special study under the guidance of a faculty member with appropriate expertise <i>Prerequisite(s):</i> Approval of the co-ordinator of the MFA program.
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 <i>Prerequisite(s):</i> Approval of the co-ordinator of the MFA program.

Food Safety and Quality Assurance

The interdepartmental collaborative program is the focal point for graduate teaching and research in food safety and quality assurance. The collaborative 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 and Graduate Co-ordinator

Mansel Griffiths (202 Food Science, Ext. 52269)
mgriffit@uoguelph.ca

Graduate Secretary

Judy Campbell (114 Food Science, Ext. 56983)
jacampbe@uoguelph.ca

Graduate Faculty

Shai Barbut

Professor, Food Science

Herman J. Boermans

Associate Professor, Biomedical Sciences

Milena Corredig

Assistant Professor, Food Science

Douglas Dalgleish

Professor, Food Science

Valerie J. Davidson

Professor, Engineering

H. Douglas Goff

Professor, Food Science

Jeffrey Gray

Associate Professor, Pathobiology

Mansel W. Griffiths

Professor, Food Science

Carlton L. Gyles

Professor, Pathobiology

Arthur R. Hill

Associate Professor, Food Science

Yukio Kakuda

Associate Professor, Food Science

Robert W. Lencki

Associate Professor, Food Science

Alex G. Marangoni

Professor, Food Science

S. Wayne Martin

Professor, Population Medicine

Scott A. McEwen

Professor, Population Medicine

Ramón Mira de Orduña

Assistant Professor, Food Science

Gauri S. Mittal

Professor, Engineering

Douglas Powell

Assistant Professor, Plant Agriculture

Peter Purslow

Chair and Professor, Food Science

Jack T. Trevors

Professor, Environmental Biology

David Waltner-Toews

Professor, Population Medicine

Keith Warriner

Assistant 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 honours program (or the equivalent) or a DVM from a recognized university or college with an average standing of at least second-class honours ('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 collaborative 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 4.0 credits) acceptable for graduate credit. This includes the seminar course which has a value of 0 credit. All students must complete:

- Food Safety and Quality Assurance Seminar (FSQA*6000).
- Food Safety and Quality Assurance Research Project (FSQA*6500). This project is equal to 1.0 credit and counts as one course of the eight required courses.
- Principles of Food Safety and Quality Assurance (FSQA*6600)
- At least five 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.

Courses

FSQA*6000 Food Safety and Quality Assurance Seminar U [0.00]

Students are expected to present two seminars during the course, one on current advances and issues in an approved area and one on their research project. Faculty associated with the program also present seminars. Students are expected to attend all seminar sessions.

FSQA*6500 Food Safety and Quality Assurance Research Project U [1.00]

An original research project related to food safety and quality assurance which includes the preparation of a written report suitable for publication and an oral presentation of the findings to the graduate faculty.

FSQA*6600 Principles of Food Safety and Quality Assurance U [0.50]

An integrated approach to factors affecting food safety and quality including microbial and chemical contamination is provided. Major food-borne disease outbreaks are studied as examples. Modern methods of quality management to minimize contamination of processed foods is discussed.

Other Graduate Courses Suitable for Credit in this Program

Biomedical Sciences

BIOM*6440 0.5 Biomedical Toxicology

Marketing and Consumer Studies

COST*6150 0.5 Quality Assurance Management

Engineering

ENGG*6110 0.5 Food and Bio-process Engineering

ENGG*6160 0.5 Advanced Food Engineering

Food Science

FOOD*6190 0.5 Advances in Food Science

FOOD*6220 0.5 Advanced Food Analysis Methodology

FOOD*6280 0.5 Rapid Methods in Food Microbiology

FOOD*6600 0.5 Advances in Food Microbiology

Human Biology and Nutritional Science

HBNS*6400 0.5 Functional Foods and Nutraceuticals

Microbiology

MICR*6070 0.5 Bacterial Structures and Virulence

Pathobiology

PABI*6000 0.5 Bacterial Pathogenesis

Population Medicine

POPM*6200 0.5 Epidemiology I

POPM*6210 0.5 Epidemiology II

POPM*6300 0.5 Epidemiology of Zoonoses

POPM*6350 0.5 Safety of Foods of Animal Origin

Undergraduate Courses Suitable for Credit in this Program

Food Science

FOOD*3010 0.5 Food Chemistry

FOOD*4120	0.5	Food Analysis
FOOD*4090	0.5	Functional Foods and Nutraceuticals

Human Biology and Nutritional Sciences

NUTR*4510	0.5	Toxicological Aspects of Nutrition
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Population Medicine

POPM*4040	0.5	Epidemiology of Food-Borne Diseases
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Food Science

Food Science may be defined as 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 February 1999, the Department of Food Science entered a new and exciting stage in its history when it moved into its newly renovated 30,000 ft² state-of-the-art teaching and research facility. In 1992, a course-based MSc in Food Safety and Quality Assurance was developed by Food Science in collaboration with several other departments at the University of Guelph. Please consult the Food Safety and Quality Assurance listing on the Graduate Studies web site for a detailed description of this MSc collaborative program.

Administrative Staff

Chair

Peter Purslow (112 Food Science, Ext. 52099)
ppurslow@uoguelph.ca

Graduate Co-ordinator

Yukio Kakuda (214 Food Science, Ext. 52260)
ykakuda@uoguelph.ca

Graduate Secretary

Judy Campbell (114 Food Science, Ext. 56983)
jacampbe@uoguelph.ca

Graduate Faculty

Shai Barbut

BSc Hebrew Univ. of Jerusalem, MS, PhD Wisconsin (Madison) - Professor

Milena Corredig

BSc Milano, MSc, PhD Guelph - Assistant Professor

Douglas Dalgleish

PhD Edinburgh - Professor and Research Chair, Dairy Technology

H. Douglas Goff

BSc (Agr) Guelph, MS, PhD Cornell - Professor

Jeffrey Gray

BSc, MSc Nebraska-Lincoln, PhD Iowa State - Associate Professor (joint appointment with Pathobiology)

Mansel W. Griffiths

BSc North-East London Polytechnic, PhD Leicester - Professor and Ontario Milk Marketing Board Industrial Research Chair in Dairy Microbiology

Arthur R. Hill

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

Yukio Kakuda

BSc, MSc California State, PhD Kansas State - Associate Professor

Robert W.J. Lencki

BASc Toronto, MASc Waterloo, PhD McGill - Associate Professor

Alex G. Marangoni

BSc McGill, PhD Guelph - Professor

Donald Mercer

BSc, PhD Waterloo - Assistant Professor, Kemptville College

Yoshinori Mine

BSc, MSc Shinshu, PhD Tokyo - Associate Professor and Egg Marketing Board Industrial Research Chair in Egg Material Science

Ramón Mira de Orduña

BSc, MSc Germany, PhD New Zealand - Assistant Professor

Gopi Paliyath

BScEd Mysore, MSc Calicut, PhD Indian Inst of Science - Associate Professor (joint appointment with Plant Agriculture)

Douglas Powell

BSc, PhD Guelph - Assistant Professor (joint appointment with Plant Agriculture - Associate Graduate Faculty)

Peter Purslow

BSc, PhD Reading - Professor and Department Chair

Keith Warriner

BSc Nottingham, PhD Aberystwyth - Assistant Professor

Rickey Y. Yada

BSc (Agr), MSc, PhD British Columbia - Professor

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 communications 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) or 213 (computer-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. Written comprehensive exams ensure that students have a solid background in food chemistry, processing/engineering and microbiology. Creativity and the ability to perform independent research is fostered by requiring PhD students to submit a written research proposal and defend it orally. Having obtained research skills during their MSc studies, PhD students are expected to conduct autonomous research. The preparation of a PhD thesis and scientific publications ensures that graduates have attained prowess in research and communication.

Admission Requirements

The usual requirement for admission into the PhD program is a research-based MSc degree with a minimum 'B' average and supportive letters of reference. Students whose first language is not English require a TOEFL score of at least 550 (paper-based) or 213 (computer-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

Food Chemistry

FOOD*6160 Chemistry of Food Lipids U [0.50]

Composition and function of lipids in food systems. Analytical procedures used in isolating, identifying and quantifying lipid components. Lipid classes and their properties. Polyunsaturated lipids and their reactions. Physical properties of lipids and instrumental methods of analysis. Industrial processing including hydrogenation, fractionation, interesterification and enzymic processes. Biotechnology of lipids.

FOOD*6170 Chemistry of Food Proteins U [0.50]

This course deals with theoretical and practical approaches to food proteins including their analysis. The following topics will be covered: physiochemical properties of proteins/amino acids, quantification of protein/amino acids, protein structure analysis, protein denaturation, chemical modification/genetic engineering and structure-functional properties of food proteins. In addition, food protein systems such as muscle, eggs, milk and vegetable proteins will be discussed.

FOOD*6210 Chemistry of Food Carbohydrates U [0.50]

This course is designed to familiarize students with the principles of carbohydrate chemistry. It focuses on the structural and functional characteristics of food carbohydrates - both sugars and polysaccharides - their analysis and applications in various food systems.

FOOD*6220 Advanced Food Analysis Methodology U [0.50]

Theory and practical applications of modern analytical techniques. Topics covered include differential scanning calorimetry, spectroscopy, gas liquid chromatography, high performance liquid chromatography and microscopy as well as various spectroscopic techniques (e.g. UV, fluorometry, circular dichroism).

FOOD*6260 Food Colloids U [0.50]

Principles of colloid science as applied to foods that contain small particles, e.g., emulsions, foams. Methods for studying colloidal particles in food materials. Manufacture, structure, properties and stability of food colloids, e.g., oil-in-water emulsions, water-in-oil emulsions, milk and dairy products. Use of food emulsifiers.

FOOD*6270 Applied Enzymology and Biotechnology U [0.50]

A lecture course dealing with principles of modern enzymology and biotechnology and their application in food science and food industry. Typical topics include - enzymes in biotechnology; basics of enzyme kinetics; enzymes in recombinant DNA technology; enzymes in analysis (ELSA, DNA-probes, reporter genes, microbial analysis); enzymes in food production, food analysis.

Food Microbiology

FOOD*6280 Rapid Methods in Food Microbiology U [0.50]

The course is designed to update knowledge of modern methods for the microbiological analysis of foods. Theory and practical applications are discussed. Methods reviewed include bioluminescence, impedimetry, immunological techniques, gene probes and other emerging technologies.

FOOD*6410 Advanced Oenology U [0.50]

A comprehensive and advanced treatise, by lectures and practice, of all aspects involved in the production of white and red table wines. Special attention is given to the basic principles involved in the vinification process as they relate to cellar technology.

FOOD*6600 Advanced Food Microbiology U [0.50]

This course will review current issues in food microbiology. Topics to be covered will include the microbial ecology of food, factors affecting the growth and survival of microorganisms in foods, and strategies for the production of safe food.

FOOD*6620 Industrial Microbiology U [0.50]

Applications of Molecular Genetics and Biotechnology to industrial microbial processes including the production of organic acids, amino acids, antibiotics, ethanol, and solvents. There is extensive coverage of the fermentation industries: baking, brewing, vinting and spirit production.

General

FOOD*6110 Food Rheology U [0.50]

Mechanical properties of foods. Application of the principles of rheology to food materials. Relationship between texture and microstructure. Instrumental measurement of food texture. Principles of measurement systems for different types of foods. Interpretation of force-deformation diagrams. Texture modification. Texture profile analysis.

FOOD*6120 Fruit and Vegetable Technology F [0.50]

A course that deals with the current status of technologies based on fruits and vegetables. The subject coverage will include post harvest storage, the parameters that determine quality, biochemical and molecular strategies for improving storage life and quality, processing technologies and issues related to genetic engineering, food safety, functional food ingredients and their health-regulatory function.

FOOD*6190 Advances in Food Science U [0.50]

Topics of current research interest and importance are examined. A project supervised by a faculty member is undertaken, the topic of which is chosen after considering the interests of the student.

FOOD*6300 Seminar U [0.50]

Each student must present a seminar on an assigned topic or a topic related to his/her research project as well as participate in the seminars of colleagues and faculty.

FOOD*6350 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. Offered jointly with HBNS*6410.

Prerequisite(s): HBNS*6400

Geography

The Department of Geography offers programs of study leading to the degrees of MA, MSc and PhD. Students may register in this department to undertake the MA and MSc programs in Collaborative International Development Studies and shared MA and MSc programs with the University School of Rural Planning and Development

Administrative Staff

Chair

Richard Kuhn (118A Hutt, Ext. 56722)
rkuhn@uoguelph.ca

Graduate Co-ordinator

Bill Nickling (353 Hutt, Ext. 53529)
nickling@uoguelph.ca

Graduate Secretary

Marilyn Klatt (129A Hutt, Ext. 56721)
mklatt@uoguelph.ca

Graduate Faculty

Harold Bauder

BA, MA Wayne State, PhD Wilfrid Laurier - Assistant Professor

Lorne P. Bennett

BA, MSc Guelph, PhD Ottawa - Assistant Professor

Aaron Berg

BSc, MSc Lethbridge, MSc Texas -Austin, PhD California -Irvine - Assistant Professor

Benjamin E. Bradshaw

BA Trent, PhD Guelph - Assistant Professor

Robin G.D. Davidson-Arnott

BA, MA, PhD Toronto - Professor

Robert C. de Loë

BA Ottawa, MA, PhD Waterloo - Associate Professor

Ze'ev Gedalof

BA, MSc Victoria, PhD Washington - Assistant Professor

Alice Hovorka

BA Queen's, MA Carleton, PhD Clark - Assistant Professor

Alun E. Joseph

BA Liverpool MA Queen's, PhD McMaster - Professor and Dean of the College of Social and Applied Human Sciences

David B. Knight

BA Macalester, MA Eastern Michigan, PhD Chicago, FRCGS - Professor

Ray A. Kostaschuk

BA Simon Fraser, MSc Calgary, PhD McMaster - Professor

Reid D. Kreutzwiser

BES, MA Waterloo, PhD Western Ontario - Professor

Richard G. Kuhn

BA Concordia, MA Victoria, PhD Alberta - Associate Professor and Chair

Janet E. Mersey

BA Mount Allison, MSc, PhD Wisconsin - Associate Professor

Kiyoko Miyanishi

BA Manitoba, MSc Western Ontario, PhD York - Associate Professor

William G. Nickling

BA McMaster, MA Carleton, PhD Ottawa - Professor

Barry Smit

BA, MA Auckland, PhD McMaster - Professor

John A. Smithers

BA Western Ontario, MA, PhD Guelph - Associate Professor

René Véron

MSc, PhD Zurich - Assistant Professor

Wanhong Yang

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

MA and MSc Programs

The Department of Geography offers both MA and MSc degrees, with specializations in resource assessment, biophysical processes, rural studies and international development. The MA program offers a specialization in rural studies, with an emphasis on rural land use, population dynamics and settlement. The MSc program stresses an experimental approach to geomorphic, biotic and landscape processes. The resource assessment specialization, focusing on opportunities, constraints and impacts in the human use of biophysical systems, and the international development specialization are available through either the MA or the MSc degree.

Admission Requirements

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 must submit a statement of their research interests with their application. They are encouraged to contact potential advisors prior to submission of an application. Students are admitted in September and applications should be completed by January 30 for consideration for admission and funding.

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 course. In addition, students must take four courses (2.0 credits), three of which must be from the Department of Geography, and these must include courses from at least two of the biophysical processes, rural studies and resource assessment course groupings (see Courses section below). For the MA degree, students must complete at least two courses from the rural studies and the resource assessment groupings combined. For the MSc degree, students must complete at least two courses in biophysical processes, one of which may be outside the department, as approved by the student's advisory committee.

Students taking the non-thesis option must complete the Research Methods course and the Research Project course. In addition, six other courses (3.0 credits) are required, at least four of which must be from the Department of Geography, and these must include courses from at least two of the biophysical processes, rural studies and resource assessment course groupings. MA students must complete at least two courses from the rural studies and the resource assessment groupings combined. MSc students must complete at least two courses in biophysical processes, one of which may be outside the Department, as approved by the student's advisory committee.

PhD Program

The objective of the PhD program is to offer opportunities for advanced research in the fields of rural resource evaluation and environmental analysis. These fields are part of a broader domain which encompasses theoretical and empirical investigations of the dynamic interrelationships between land, water and biological processes and the social and economic contexts in which these processes occur. These socio-environmental relationships can be addressed at various geographic scales, from the local to the global. The unifying theme is the focus on integration and evaluation.

The fields of rural resource evaluation and environmental analysis include three overlapping areas of specialization:

- **Biophysical Processes** encompasses the analysis of geomorphic and biotic phenomena and processes.
- **Rural Studies** embraces the spatial organization of human activity in the rural milieu.
- **Resource Assessment** centres on the evaluation of constraints, opportunities and impacts in the human use of biophysical systems.

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. They are encouraged to contact potential advisors in the department prior to submission of an application. Students are admitted in September and applications should be completed by January 30 for consideration for admission and funding.

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. The broader scholarly field must embrace the resource assessment area of specialization and at least one other specialization. Submission and defence of an acceptable thesis on an approved topic complete the requirements of the PhD.

Interdepartmental Programs

Collaborative International Development Studies MA and MSc Programs

The Department of Geography participates in the MA and MSc programs in Collaborative International Development Studies (CIDS). Both thesis and non-thesis options are available. Students selecting the thesis option are expected to complete an acceptable thesis, the five 'core' courses in CIDS, the Research Methods course offered by the Department of Geography, and one other geography course (0.5 credits) approved by the student's advisory committee. Students selecting the non-thesis option are expected to complete the five 'core' courses in CIDS, the Research Methods course and Research Project course in the Department of Geography, and two other geography courses (1.0 credits) approved by the student's advisory committee. Please consult the International Development Studies listing for a detailed description of the MA/MSc collaborative program.

Rural Studies PhD Program

The Department of Geography participates in the PhD program in rural studies in the field of sustainable rural communities. Those faculty members whose research and teaching expertise includes aspects of rural studies may serve as advisors for PhD students.

Courses

Biophysical Processes

GEOG*6330 Biotic Processes and Biophysical Systems U [0.50]

Investigation of biotic processes influencing the composition, structure and distribution of plant and animal communities and of approaches to biophysical systems analysis, focusing on environmental system interaction at the landscape scale.

GEOG*6500 Sedimentary Processes in Geomorphology W [0.50]

An integrated study of fluid flow and sedimentary processes in water and air, setting key elements of sediment erosion, transport and deposition within a global context.

GEOG*6610 Global Hydrology F [0.50]

An examination of global environmental hydrology including precipitation, evaporation, subsurface water and runoff. Physical processes, measurement, analytical techniques and modelling strategies will be considered in the context of global change.

Rural Studies

GEOG*6200 Land Use and Agricultural Systems F,W [0.50]

Rural land uses and processes, particularly agricultural systems, their dynamics and interactions with the resource base and competing activities. Theoretical models and analytical methods related to applied questions in agricultural decision making and land use planning.

GEOG*6270 Rural Community Systems W [0.50]

Characterization and delineation of rural community systems in Canada with attention to the impact of processes of centralization and diffusion on rural economy, society and settlement. Credit may not be obtained for both GEOG*6270 and 9506020.

Resource Assessment

GEOG*6281 Environmental Resource Evaluation F [0.50]

Analysis, evaluation and management of environmental resources. Emphasis is on biophysical and socio-economic concepts and methods which offer a more comprehensive and integrative basis for environmental decisions.

GEOG*6340 Human-Environment Systems Analysis F [0.50]

A critical review of philosophies, concepts and analytical methods for analysis and management of systems involving the interaction of environmental processes and human spatial activity.

International Development Studies

GEOG*6400 Urbanization and Development (alternate years) 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.

GEOG*6450 Political Identities, Territory and Territoriality(alternate years) 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.

General

GEOG*6060 Special Topics in Geography F [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.

GEOG*6090 Research Methods F-W [0.50]

A review of philosophies and research methods in geography. The development and presentation of a context paper and proposal for the thesis or research project. This course extends over two semesters (fall and winter)

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 F,W,S [1.00]

The preparation and presentation of a report on the research project approved in GEOG*6090.

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. All applications, with requests for financial support, must be received by the Tri-University Graduate Program secretary in completed form by February 1.

Administrative Staff - Tri-University Program

Director

Richard Reid (328 MacKinnon, Ext. 53202)
rreid@uoguelph.ca

Tri-University Secretary - Guelph

Diane Purdy (101 Day Hall, Ext. 53556)
dpurdy@uoguelph.ca

Graduate Co-ordinator 2005-2006

Peter Goddard (325 MacKinnon, Ext. 54460)
pgoddard@uoguelph.ca

Graduate Officer - Laurier

Michael Sibalis (509 DAWB - Laurier, Ext. 3141)
msibalis@wlu.ca

Graduate Officer - Waterloo

Ken McLaughlin (324 St. Jerome's University - Waterloo, Ext. 218)
kmclaugh@uwaterloo.ca

Graduate Secretary

Barbara Merritt (345 MacKinnon, Ext. 56528)
bmerritt@uoguelph.ca

Graduate Secretary - Laurier

Lynne Doyle (4-210 CTB - Laurier, Ext. 3389)
ldoyle@wlu.ca

Graduate Faculty

Note

(*indicates approved PhD Advisors)

Donna T. Andrew *

BA CCNY, MSc London, PhD Toronto - Professor

Catherine Carstairs

AB Harvard, Dip Ed McGill, MA, PhD Toronto - Assistant Professor

Keith M. Cassidy *

BA Loyola College, MA, PhD Toronto - Associate Professor

Bill Cormack *

BA Calgary, MA Carleton, PhD Queen's - Associate Professor

Terry A. Crowley *

BA Bishop's, MA Carleton, AM, PhD Duke - Professor and Chair

Elizabeth L. Ewan *

BA Queen's, PhD Edinburgh - Professor and University Research Chair

Peter A. Goddard *

BA, UBC, DPhil Oxford - Associate Professor

Alan Gordon *

BA Toronto, MA, PhD Queen's - Associate Professor

Susannah C. Humble Ferreira

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

Kevin J. James

BA, MA McGill, PhD Edinburgh - Assistant Professor

Sofie Lachapelle

BSc, MA Montreal, PhD Notre Dame - Assistant Professor

Linda L. Mahood *

BA Saskatchewan, M Litt, PhD Glasgow - Associate Professor

P. Douglas McCalla *

BA Queen's, MA Toronto, DPhil Oxford - Professor

Stuart G. McCook *

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

Alan McDougall

BA, MSt, DPhil Oxford - Assistant Professor

Graeme Morton

BA, PhD Edinburgh - Chair, Scottish Studies

Jacqueline Murray *

BA British Columbia, MA, PhD Toronto - Professor and Dean of the College of Arts

Susan Nance

BA, MA Simon Fraser, PhD California (Berkeley) - Assistant Professor

Jesse S. Palsetia *

BA, MA, PhD Toronto - Associate Professor

Karen Racine *

BA Saskatchewan, MA, PhD Tulane - Associate Professor

Richard M. Reid *

BA Carleton, MA, PhD Toronto - Associate Professor and Director, Tri-University Program

Norman D. Smith

BA, MA, PhD British Columbia - Assistant Professor

Catharine A. Wilson *

BA Guelph, MA, PhD Queen's - Associate Professor

Graduate Faculty from Wilfrid Laurier University

Cynthia Comacchio

BA Glendon, MA York, PhD Guelph

Terry Copp

BA Sir George Williams, MA McGill

Leonard G. Friesen

BA Waterloo, MA, PhD Toronto

Richard P. Fuke

BA Toronto, MA Maryland, PhD Chicago

Barry M. Gough

BEd British Columbia, MA Montana, PhD London

Douglas A. Lorimer

BA, PhD British Columbia

Joyce Lorimer

BA, PhD Liverpool

David Monod

BA, MA McGill, PhD Toronto

Erika Rummel

BA Vienna, MA, PhD Toronto

Michael D. Sibalis

BA McGill, MA Sir George Williams, PhD Concordia

Steven Streeter

BA Bates College, MA SUNY, MA California (Riverside), PhD Connecticut

George Urbaniak

BA, MA, PhD Toronto

Suzanne Zeller

BA, MA Windsor, PhD Toronto

Graduate Faculty from the University of Waterloo

Gail Cuthbert Brandt

BA Toronto, MA Carleton, PhD York

John English

BA Cambridge, MA, PhD Harvard

Patrick J. Harrigan

AB Detroit, MA, PhD Michigan

Geoff W. Hayes

BA, MA Laurier, PhD Western Ontario

Andrew Hunt

BA, PhD Utah

Stan K. Johannesen

BA Evangel College, MA, PhD Missouri

Heather A. MacDougall

BA, MA, PhD Toronto

Karin J. MacHardy

BA, MA Western Ontario, PhD California (Berkeley)

Ken M. McLaughlin

BA Waterloo, MA Dalhousie, PhD Toronto

Wendy L. Mitchinson

BA, MA, PhD York

Werner O. Packull

BA Guelph, MA Waterloo, PhD Queen's

C. Arnold Snyder

BA Waterloo, MA, PhD McMaster

Lynne Taylor

BA Western Ontario, MA London, PhD Michigan

James A. Wahl

BA Western Ontario, MA, PhD St. Louis

James W. Walker

BA Toronto, MA Waterloo, PhD Dalhousie

David E. Wright

BA Cambridge, PhD McMaster

MA Program

The MA (by thesis) program provides for emphasis on medieval and modern British history; Scottish studies; Canadian history; the United States from the colonial period to the 20th century; medieval and early modern European history; selected aspects of late 19th- and 20th-century European history; gender, family, and women's history in Europe, Britain, and North America; the social and military impact of war, race and slavery; global history; rural history; and the history of science, technology and medicine.

Admission Requirements

An applicant must have a recognized honours degree in history, or its equivalent, with at least a high second class or upper 'B' average. Applicants are required to include with their application a separate statement describing their proposed area of study and, where possible, the suggested thesis topic.

Degree Requirements

Students normally obtain the MA degree by satisfactorily completing six courses (at least 3.0 credits) and submitting a major paper on an approved topic (10,000 to 12,000 words). Alternatively, the student may qualify for the MA degree by completing four courses (at least 2.0 credits) and submitting a satisfactory thesis on an approved topic (25,000 words). They may also qualify for an MA by completing 8 courses (at least 4 credits) three of which must require a research paper. It is recommended but not required that students take HIST*6000 and HIST*6020. The remaining courses are subject to the approval of the Department of History. A reading knowledge of French is highly recommended and a student's advisory committee may require a second language for research purposes. MA students generally register for up to three courses per semester, or two if they hold a graduate teaching assistantship.

Graduate students are encouraged to consider including, as part of their program, appropriate graduate course offerings from other departments.

Interdepartmental Programs

Scottish Studies Interdepartmental Group

The Department of History participates in the activities of the 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

Each student is required to demonstrate competence in one major field and two areas of concentration. This competence will be demonstrated by successful completion of the colloquium or the qualifying examination. One area of concentration must be in an area of study distinct from the major field and one area of concentration 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 by geographical or chronological span. The major field and areas must be constructed so that a student can complete the major during two terms and both areas of concentration within another two terms. Students must take a seminar course in each of their qualifying or colloquium fields.

The student's advisory committee, in collaboration with the student, will establish the field and areas to be examined. The student's advisory committee, in collaboration with the candidate, will select either the comprehensive or the colloquium mode of examination, determine the scheduling of the examinations or colloquium, and approve the thesis proposal submitted by the student before the student proceeds to the examination. The comprehensive mode involves one historiographical essay and one written examination in each field or area and an oral examination covering the three. The colloquium mode requires two essays, one of which must be historiographical, to be written in each field or area. Following the completion of field preparations to the satisfaction of the advisory committee, the candidate in the colloquium mode presents an independent research paper on a topic approved by the advisory committee. For both modes, the examining committee will be composed of the thesis advisor, the field or area advisors, an additional member of the graduate faculty, and the director or designate as chair.

The PhD fields and the oral qualifying examination must be completed by the end of the fifth term/semester. The colloquium must be completed by the end of the sixth term/semester. No extensions will be permitted, except in cases where approval has been given by the co-ordinating committee. Continuation in the program after the qualifying exam or colloquium requires at least a B+ average, based on all courses taken in the program to that point and their proportionate weighting.

Following successful completion of the colloquium or qualifying examination, 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. A thesis embodying the results of that research must be presented and defended before an examining committee. The Tri-University Doctoral Program limits thesis supervision to five fields of study - Canadian history; Scottish history; early modern European history; modern European history; Race, Slavery and Imperialism.

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. Students will be admitted only 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 statement 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

Students must demonstrate a knowledge of written French (or other appropriate second language, approved by the co-ordinating committee) before the qualifying examination. Students must register in the Doctoral Seminar. For details see the program handbook.

Courses - MA

Note

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

Canadian History

HIST*6230 Canadian History I U [0.50]

A course that examines the current historiography of selected aspects of Canadian history. Topics will vary with the expertise of individual instructors.

HIST*6280 Canadian History II U [0.50]

A course that examines the current historiography of selected aspects of Canadian history. Topics will vary with the expertise of individual instructors.

HIST*6290 Topics in North American History U [0.50]

Depending on the expertise of the instructor, this course may concentrate on either the United States or Canada, or it may select an historical theme or themes common to the larger continent.

Scottish History

HIST*6150 Scottish Archival Research U [0.50]

This course will comprise of classroom teaching, practical instruction and work-placement within the Scottish Collection of the University of Guelph's Archives. It will introduce students to basic skills in the digitization of sources and teach competence in conservation, record creation and archival research.

Restriction(s): Student numbers are limited by the number of placements available in the University Archives.

HIST*6190 Topics in Scottish History I U [0.50]

This course will introduce students to selected aspects of medieval and early modern Scottish history and historiography, including the use of source materials, and practical training involving manuscripts in the University Archives.

HIST*6200 Topics in Scottish History II U [0.50]

This course will introduce students to selected aspects of modern Scottish history and historiography, including the use of source materials, and provide practical training involving manuscripts in the University Archives.

British History

HIST*6140 Topics in British History Since 1688 U [0.50]

Although topics vary with the expertise of individual instructors, this course encompasses the British Isles.

General**HIST*6000 HIST*6000 Historiography I F [0.50]**

This course will introduce students to some of the essential components of the historical process as exemplified by the literature produced prior to 1914. It will also assess history as a cognitive discipline in contemporary society. While the scope of the course will extend from ancient times to the eve of World War I, emphasis will be placed on 19th-century historiography.

HIST*6020 Historiography II W [0.50]

An examination of major examples of recent historical methodology, including works in cultural and social history. The student is also expected to develop and present a thesis proposal.

HIST*6040 Special Reading Course U [0.50]

Students selecting this course should speak to individual instructors to arrive at appropriate topics.

HIST*6300 Topics in Modern Europe I U [0.50]

This seminar course will focus on selected aspects of the political and social history of Europe between 1789 and 1989. Topics to be examined will vary according to the expertise of the faculty and the interest of the students.

HIST*6310 Topics in Modern Europe II U [0.50]

This seminar course will focus on selected aspects of the political and social history of Europe between 1789 and 1989. Topics to be examined will vary according to the expertise of the faculty and the interest of the students.

HIST*6350 History of the Family U [0.50]

This course will cover a broad range of historical developments within the family, all concentrating on the interaction between the family (or elements within it) and outside authority (both formal and informal).

HIST*6360 History of Sexuality and Gender U [0.50]

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.

HIST*6370 Topics in Cultural History U [0.50]

History 6370 investigates the practices of cultural history and the utility of the cultural history paradigm in the investigation of topics including politics and power, religion, war, empire, gender, class, 'race', ethnicity, the environment, and consumption.

HIST*6380 Topics in Early Modern European History U [0.50]

This seminar course examines current issues in early modern European history as selected by instructor(s). Participants review current research and historiography, discuss the principal debates, and develop their own perspectives through encounter with primary source materials.

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*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*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.

Courses - PhD**HIST*7000 Doctoral Seminar U [0.00]**

This seminar will meet regularly every semester to discuss research problems and issues of professional interest.

HIST*7010 Qualifying Examination U [1.00]

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*7020 Colloquium U [1.00]

This public presentation of the student's research in the major field is assessed on the basis of 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 [1.00]**HIST*7050 First Minor Field U [0.50]****HIST*7060 Second Minor Field U [0.50]**

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*7120 British History Major Seminar U [1.00]****HIST*7120 Scottish History Major Seminar U [1.00]****HIST*7120 British History Major Seminar U [1.00]****HIST*7120 Scottish History Major Seminar U [1.00]****HIST*7130 Community Studies 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*7160 Gender, Women and Family Major Seminar U [1.00]****HIST*7170 Race, Slavery, and Imperialism Major Seminar U [1.00]****HIST*7180 United States History Major Seminar U [1.00]****HIST*7600 Canadian History Minor Seminar U [0.50]****HIST*7610 British History Minor Seminar U [0.50]****HIST*7620 Scottish History Minor Seminar U [0.50]****HIST*7630 Community Studies Minor Seminar U [0.50]****HIST*7640 Early Modern European History Minor Seminar U [0.50]****HIST*7650 Modern European History Minor Seminar U [0.50]****HIST*7660 Gender, Women and Family Minor Seminar U [0.50]****HIST*7670 Race, Slavery, and Imperialism Minor Seminar U [0.50]****HIST*7680 United States History Minor Seminar U [0.50]****HIST*7690 International History Minor Seminar U [0.50]****HIST*7700 Science, Medicine and Technology Minor Seminar U [0.50]****HIST*7710 Other Minor Seminar U [0.50]****HIST*7990 HIST*7990 U [2.00]**

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.

Hospitality and Tourism Management

Administrative Staff

MBA Graduate Programs
Faculty of Management
150 Research Lane, Suite 205
Guelph, ON
N1G 2W1
Toll Free: 1-888-622-2474
Local: 519-824-4120
Fax: 519-836-0661
www.emba.uoguelph.ca

Faculty of Management

Interim Associate Dean of the Faculty of Management

Joe Barth (207 MINS, Ext. 54867)
jbarth@uoguelph.ca

Director of Graduate Programs, Faculty of Management

Ralph Sykes (150 Research Lane, Suite 205, Ext. 56630)

Manager of Graduate Programs, Faculty of Management

Patti Lago (150 Research Lane, Suite 205, Ext. 56607)
plago@uoguelph.ca

MBA Logistics Assistant (distance MBA)

Raj Patara (150 Research Lane, Suite 205, Ext. 53787)
rpatara@uoguelph.ca

Hospitality and Tourism Management

Director

Marion Joppe (201 MACS, Ext. 56118)
mjoppe@uoguelph.ca

MBA (Distance) Graduate Program Co-ordinator

Michael Cox (308 MACS, Ext. 56597)
mcox@uoguelph.ca

MBA (Residential) Graduate Program Co-ordinator

Iain Murray (303 MACS, Ext. 54331)
jmurray@uoguelph.ca

Graduate Secretary (residential MBA)

Brenda Kupferschmidt (200 MACS, Ext. 54256)
bkupfers@uoguelph.ca

Graduate Faculty

Clayton Barrows

BS,MS, EdD Massachusetts - Professor

J.E. (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 - Assistant Professor

Julia Christensen Hughes

BComm Guelph, MBA, PhD York - Associate Professor

Michael Cox

CD Naval Officer Program, MA Western Washington, PhD Union (Ohio), MCIM Chartered Institute of Marketing Management - Assistant Professor

Joan Flaherty

BA, MA, MSc, Guelph - Assistant Professor

Stefan Groschl

MMA Germany, MSc, PhD Oxford Brookes - Assistant Professor

Robert J. Harrington

BBA Boise State, MBA, PhD Washington State - Associate Professor

Marion Joppe

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

Stephen Lynch

BA, BEd Toronto, MA Duquesne, MSc California American, PhD Bradford (England) - Assistant Professor

Donald J. MacLaurin

BS Florida International, MS Nevada (Las Vegas), PhD Kansas State - Associate Professor

Tanya MacLaurin

BS, MS, PhD Kansas State - Associate Professor

Iain Murray

BComm, MSc Guelph, PhD Kansas State - Associate Professor

Michael Ottenbacher

BS, MS Florida International, PhD Otago (New Zealand) - Assistant Professor

Catherine E. Ralston

BASc Guelph, MBA Western Ontario, PhD Wisconsin (Madison) - Assistant Professor

Margaret Shaw

BS, MBA, PhD Cornell - Professor

Geoffrey W. Smith

MBA Guelph - Assistant Professor

John Walsh

BA Thames Polytechnic, MBA, PhD Western Ontario - Professor

MBA Program

The Master of Business Administration Hospitality and Tourism degree program prepares students for advanced career in hospitality, tourism and service industries. Three study options are available to suit different needs and personal circumstances. Regardless of the option selected, the MBA program has both course work and research components. The common core of knowledge expected of all MBA graduates is an advanced understanding of hospitality service systems in general with specific knowledge as applied to management, marketing, tourism, organizational behaviour, finance and research methods.

Admission Requirements

Applicants must meet university requirements for admission to graduate studies. Students come to the program from a variety of disciplines and normally have at least three years of relevant industry experience. Those with academic business backgrounds are usually ready to enter into their graduate work immediately. Students without business backgrounds may be required to take foundation courses in the hospitality field. It may also be necessary for those with liberal arts backgrounds to take foundation courses in both hospitality and business. Each student's program is designed to take advantage of the individual's particular needs and strengths.

The following foundation courses are required of all MBA students:

- Computer literacy
- Accounting
- Finance
- Marketing
- Hospitality management/operations
- Organizational behaviour

Normally, the above requirements will be satisfied by university-level courses taken prior to commencement of graduate studies. Some requirements may be satisfied by work experience. The MBA Admissions committee considers each applicant on his/her own merit and decides if foundation courses are required. The Graduate Management Admissions Test (GMAT) may be requested as evidence of academic ability in certain cases. Applicants whose primary language is not English are required to take the TOEFL including the Test for Written English (TWE) and the Test for Spoken English (TSE). The TOEFL requirement may be waived on the basis of a personal interview.

Degree Requirements

The MBA program in the School of Hospitality and Tourism Management (HTM) is designed to teach general principles of management and decision-making as applied to managerial, consulting or education careers in the realm of hospitality, service or tourism. Research is required of all graduate students in the form of class projects, and a thesis or major paper. The MBA program offers a thesis option (2 or more years) and a major paper option (1 year residential). Research topics depend on the student's area of interest, work experience and area of study. Distance option students may select an applied research paper based on their workplace. Students work with one or more advisors composed of graduate faculty members.

The general philosophy of the school is to balance individual student learning goals with core business and industry knowledge to assure a quality program. Beyond basic requirements, courses may be selected from several supporting disciplines. Students will be guided in this by their advisory committee and the graduate co-ordinator. The graduate co-ordinator serves as temporary advisor to incoming students and provides direction until a major advisor is selected.

Thesis Track

The thesis option requires at least an additional year of study. This option currently requires at least nine graduate courses (4.5 credits) plus the thesis. With proposed curriculum revisions this will increase to fourteen courses. At least six of the graduate courses must be taken in the School. One course must be in each of the areas of hospitality management, finance, organizational behaviour and hospitality marketing; at least two courses in research methods selected from those available, and at least three courses in the area of specialization (marketing and tourism, organizational behaviour or management). A cumulative grade of 'B-' or better is required for graduation. The program normally takes at least six semesters over two years, with provision for additional time as necessary for thesis completion. The School offers summer courses infrequently, so all students (especially international) should plan accordingly to complete their thesis research, writing and defence.

The thesis is based on research in a topic in the student's specialization, which will depend on the student's interests, work experience and course of study. It must demonstrate

capacity for original and independent work, and include a critical evaluation of work which has previously been done in the same field of research. The thesis proposal must be submitted in writing and orally presented to the graduate faculty for approval before commencement of work.

Thesis Track

Semester I

HTM*6050	Management Communications
HTM*6110	Foundations of Leadership
HTM*6150	Research Methods for Managers
HTM*6300	Hospitality and Tourism Marketing
AGEC*6180	Financial and Managerial Accounting

Semester II

HTM*6140	Foundations of Human Resource Management
HTM*6220	Special Topics in Management Issues
HTM*6530	Safety, Security and Risk Assessment in HTM
HTM*6700	Hospitality and Tourism Strategic Management
AGEC*6220	Financial Management

Semester III

HTM*6170	Hospitality and Tourism Economics and Policy
HTM*6510	Hospitality and Tourism Revenue Management
HTM*6550	Managing Service Quality
HTM*6800	Operations Management OR
AGEC*6410	Operations Management
UNIV*7500	Research/Writing

Note that there is considerable opportunity for students to customize their curricula with their chair and special committee advisors. The course requirements are minimums. Students may take more than the minimum number of courses required.

The thesis is based on research in a topic in the student's specialization. The topic will depend on the student's interests, work experience and course of study. It must demonstrate the student's capacity for original and independent work, and must include a critical evaluation of work that has previously been done in the same field of research. The thesis proposal must be submitted in writing and orally presented to the graduate faculty for approval before commencement of the research.

Course work and Major Paper Track

A challenging combination of coursework and a major paper of publishable quality, is intended for people who expect the MBA to be a terminal degree and plan to enter the workforce after completion. The major paper examines the student's ability to conduct research on an applied subject of their choice. Due to the short duration of this track, there is limited opportunity for students to customize their curricula. Students wishing to customize their program extensively are advised to consider the thesis track.

This track requires at least 13 graduate courses (6.5 credits) and a 1.0 credit major paper of publishable quality, or 15 graduate courses (7.5 credits). The major paper will be a detailed critical review of an area of study specific to the specialization of the student that includes analysis and interpretation of relevant data.

At least six of the graduate courses must be taken in the School of Hospitality and Tourism Management. One course must be in each of the areas of management, finance, organizational behaviour and marketing; at least one course in research methods and at least three courses in an area of specialization (marketing, organizational behaviour or management). A cumulative grade of B- or better is required for graduation.

Coursework and Major Paper Track

Semester I

HTM*6050	Management Communications
HTM*6110	Foundations of Leadership
HTM*6150	Research Methods for Managers
HTM*6300	Hospitality and Tourism Marketing
AGEC*6180	Financial and Managerial Accounting

Semester II

HTM*6140	Foundations of HR Management
HTM*6220	Special Topics in Management Issues
HTM*6530	Safety, Security and Risk Assessment in HTM
HTM*6700	Hospitality and Tourism Strategic Management
Elective	
AGEC*6200	Financial Management

Semester III

HTM*6170	Hospitality and Tourism Economics Policy
HTM*6510	Hospitality and Tourism Revenue Management
HTM*6550	Managing Service Quality
HTM*6800	Service Operations
Elective	
AGEC*6410	Operations Management OR
Elective	

Distance Track (3 years, 9 semesters of study)

This combination of coursework by distance and short residential components is intended for career professionals who expect the MBA to be a terminal degree and need to continue

their careers while studying. A major paper examines the student's ability to conduct research on an applied topic, usually related to their place of work, or may be replaced by two extra courses.

The distance components can be taken anywhere Internet service is available. The one-week residential components are taken at the University of Guelph in June in each of the two years required to complete the program.

The distance track requires at least 13 graduate courses (6.5 credits) and a 1.0 credit major paper of publishable quality (or two additional courses). At least six of the graduate courses must be taken in the School of Hospitality and Tourism Management. One course must be in each of the areas of management, finance, organizational behaviour and marketing; at least one course in research methods and at least three courses in an area of specialization (marketing, organizational behaviour or management). A cumulative grade of 'B-' or better is required for graduation.

Distance Track

Semester I (Summer)

Residential Week I - Introduction to Distance Learning

HTM*6110	Foundations of Leadership
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Semester II (Fall)

HTM*6140	Foundations of Human Resource Management
AGEC*6180	Financial and Managerial Accounting

Semester III (Winter)

HTM*6150	Research Methods for Managers
HTM*6300	Hospitality and Tourism Marketing

Semester IV (Summer)

Residential Week II

HTM*6050	Management Communications
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Semester V (Fall)

HTM*6220	Special Topics in Management Issues
Elective	
AGEC*6200	Financial Management

Semester VI (Winter)

HTM*6170	Hospitality and Tourism Economics and Policy
HTM*6530	Safety and Risk Assessment in HTM

Semester VII (Summer)

HTM*6800	Operations Management
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Semester VIII (Fall)

HTM*6510	Hospitality and Tourism Revenue Management
HTM*6700	Hospitality and Tourism Strategic Management

Semester IX (Winter)

HTM*6550	Managing Service Quality
HTM*6900	Major Paper
Elective	

Courses

Hospitality Management

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.

HTM*6700 Hospitality and Tourism 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): Non MBA students only by permission of instructor.

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): Non MBA students only by permission of instructor.

Hospitality Marketing and Tourism

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.

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): Non MBA students only by permission of instructor.

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.

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.

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.

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.

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.

Organizational Behaviour**HTM*6110 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): Non MBA students only by permission of instructor.

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.

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.

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): Non MBA students only by permission of instructor.

All Specializations**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): Non MBA students only by permission of instructor.

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): Non MBA students only by permission of instructor.

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): Non MBA students only by permission of instructor.

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): Non MBA students only by permission of instructor.

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): Non MBA students only by permission of instructor.

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.

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.

Human Biology and Nutritional Sciences

The Human Biology 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:

- **Biodynamics** -- Bent, Dickey, Jadeski, Lindinger, Murrant, Vallis
- **Nutrition, Exercise and Metabolism** -- Bakovic, Bonen, Dyck, Graham, Robinson, Spriet
- **Nutritional and Nutraceutical Sciences** -- Bakovic, Bettger, Duncan, Kirkland, Meckling, Robinson, Woodward, Wright

Interdepartmental programs are available for students wishing to specialize in aquaculture or toxicology.

Admission Requirements

Admission to all graduate programs in the Department of Human Health and Nutritional Sciences will normally be granted in September. Completed applications should arrive in the department by April 1 of the year in which the student wishes to begin study. Applications from international students, especially those applying for financial support, should arrive by December 1 of the year before the expected date of admission.

Administrative Staff

Chair

Terry E. Graham (354 Animal Science/Nutrition Bldg., Ext. 56168)
terrygra@uoguelph.ca

Graduate Co-ordinator

David J. Dyck (345 Animal Science/Nutrition Bldg., Ext. 56578)
ddyck@uoguelph.ca

Graduate Secretary

Andra Williams (352 Animal Science/Nutrition Bldg., Ext. 56356)
amwillia@uoguelph.ca

Graduate Faculty

Marica Bakovic

BSc, MSc Belgrade, PhD Alberta - Assistant Professor

Leah R. Bent

BSc, MSc Guelph, PhD British Columbia - Assistant Professor

William J. Bettger

BS, PhD Missouri - Associate Professor

Arend Bonen

BA Western, MS, PhD Illinois - Professor

James P. Dickey

BSc, MSc Waterloo, PhD Queen's - Assistant Professor

Alison M. Duncan

BASc Guelph, MSc Toronto, PhD Minnesota - Assistant Professor

David J. Dyck

BSc, MSc, PhD Guelph - Associate Professor

Terry E. Graham

BA & BPHE, MSc, PhD Queen's - Professor and Chair

Lorraine Jadeski

BSc Guelph, MSc Waterloo, PhD Western - Assistant Professor

James B. Kirkland

BSc, PhD Guelph - Associate Professor

Michael I. Lindinger

BSc Victoria, MSc, PhD McMaster - Associate Professor

Kelly A. Meckling

BSc Calgary, PhD Toronto - Associate Professor

Coral L. Murrant

BSc, PhD Guelph - Assistant Professor

Lindsay E. Robinson

BSc Acadia, PhD Alberta - Assistant Professor

Lawrence L. Spriet

BSc Waterloo, MSc York, PhD McMaster - Professor

Lori A. Vallis

BSc, MA Ottawa, PhD Waterloo - Assistant Professor

William D.H. Woodward

BSc, MSc British Columbia, PhD Sheffield - Professor

Amanda Wright

BSc, PhD Guelph - Assistant Professor

MSc Program

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 are urged to identify and contact a faculty member who is willing to serve as their advisor.

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 not fewer than 1.5 graduate credits. The graduate credits of course work will consist of:

a) at least one of:

HBNS*6020	0.5	Biodynamics
HBNS*6700	0.5	Nutrition, Exercise and Metabolism
HBNS*6040	0.5	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:

HBNS*6010	0.5	Seminar in Human Biology and Nutritional Sciences
HBNS*6320	0.5	Advances in Human Biology and Nutritional Sciences Research

at least one of:

HBNS*6910	0.5	Basic Research Techniques and Processes
HBNS*6920	0.5	Applied Research Techniques and Processes
HBNS*6930	0.5	Research Project

at least one of:

HBNS*6020	0.5	Biodynamics
HBNS*6700	0.5	Nutrition, Exercise and Metabolism
HBNS*6040	0.5	Research Fronts in Nutritional and Nutraceutical Sciences

at least 1.0 to 2.0 graduate credits of electives.

PhD Program

Applicants must have a recognized master's degree in a related field obtained with a minimum academic standing of 80% in their postgraduate studies, and the endorsement of a potential thesis advisor. Applicants should have completed a course in statistics. Under exceptional circumstances admission directly to a PhD program with an appropriate honours degree alone, or transfer from MSc to PhD program without completing the MSc thesis requirements, is also possible.

Degree Requirements

The major part of a student's time will be devoted to research in fulfilment of the dissertation requirement. Course work would be established through discussion with the student's Advisory Committee.

PhD students will become candidates for the PhD degree upon completion of a qualifying examination, which must be conducted not later than the fifth semester of the PhD program. The examination will be primarily research focused.

Thesis Requirements

Submission and defence of an acceptable dissertation complete the requirements for a PhD. An acceptable dissertation comprises a report of the candidate's research on a particular and well-defined research problem or hypothesis. It should represent a significant contribution to knowledge in that field. Emphasis is placed on the quality of the work judged by the expression of mature scholarship and critical judgment in the dissertation. Dissertation approval implies that it could be published in reputable, refereed journals in its field.

Interdepartmental Programs

Toxicology MSc/PhD Collaborative Program

The Department of Human Health and Nutritional Sciences participates in the MSc/PhD program in Toxicology. Professor Kirkland is a member of the Toxicology Interdepartmental Group. This faculty member's research and teaching expertise includes aspects of toxicology; he may serve as advisor for MSc and PhD students. Please consult the Toxicology listing for a detailed description of the MSc/PhD collaborative program.

Biophysics Interdepartmental Group (BIG)

Several faculty members in the Department of Human Health and Nutritional Sciences are members of the Biophysics Interdepartmental Group, which offers MSc and PhD programs in biophysics. Students admitted to and enrolled in the biophysics program and advised by a member of the graduate faculty in the Department of Human Health and Nutritional Sciences will be accommodated in the facilities of the department but are subject to the regulations of the biophysics program. Members of the graduate faculty in the Department of Human Health and Nutritional Sciences who are members of the Biophysics Interdepartmental Group are permitted to advise MSc and PhD students in biophysics. These faculty members include J.P. Dickey and M. Lindinger. Please consult the Biophysics listing for a detailed description of the graduate programs offered by the Biophysics Interdepartmental Group.

Courses

HBNS*6010 Seminar in Human Biology 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 HBNS MSc course work and project students only

HBNS*6020 Biodynamics F [0.50]

This course considers the integrated activities of the human organism, spanning from the cellular level to the whole body. The purpose is to further develop concepts that comprise a foundation for understanding neuromuscular and musculoskeletal systems.

HBNS*6030 Applied Ergonomics U [0.50]

Reviews selected topics in ergonomics from a multidisciplinary perspective with special reference to understanding the scientific basis of associated data gathering techniques and to practicing the necessary skills. This course is also a graduate course offering in the Department of Psychology

HBNS*6040 Research Fronts in Nutritional and Nutraceutical Sciences F [0.50]

Building on an information base in nutrition, biochemistry and physiology, the course comprises selected research topics pertaining to the importance of nutrition as a determinant of health throughout the life span. Distinction will be drawn between the metabolic basis of nutrient essentiality and the health protectant effects of nutraceuticals.

HBNS*6130 Advanced Skeletal Muscle Metabolism in Humans W [0.50]

This course examines how the energy provision pathways in human skeletal muscle and associated organs meet the energy demands of the muscle cell during a variety of metabolically demanding situations.

HBNS*6320 Advances in Human Biology and Nutritional Sciences Research S,F,W [0.50]

This course provides the student with an opportunity to study a topic of choice and involves literature research on a chosen topic. The course may stand alone (MSc thesis and PhD students) or provide the background information for an experimental approach to the topic (MSc course work and project students).

HBNS*6400 Functional Foods and Nutraceuticals F [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.

HBNS*6410 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 Functional Foods and Nutraceuticals (HBNS*6400).

HBNS*6440 Nutrition, Gene Expression and Cell Signalling (offered odd-numbered years) 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.

HBNS*6700 Nutrition, Exercise and Metabolism F [0.50]

A discussion of recent concepts in the relationships among nutrition, exercise and metabolism. Information from the molecular to the whole-animal 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.

HBNS*6710 Advanced Topics in Nutrition and Exercise W [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 HBNS*6700, the focus of this course will be to develop the student's ability to independently analyze original research investigations.

HBNS*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. (Instructor's signature required.)

HBNS*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. (Instructor's signature required.)

HBNS*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. (Instructor's signature required.)

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

Applied Human Nutrition

Programs of study leading to the MSc and PhD degree are available through the Department of Family Relations and Applied Nutrition.

Animal Nutrition

Programs of study leading to the MSc and PhD degree in animal nutrition are available in the Department of Animal and Poultry Science.

International Development Studies

The Collaborative International Development Studies (CIDS) 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 and Graduate Co-ordinator

Sally Humphries (702 MacKinnon, Ext. 53542)
shumphri@uoguelph.ca

Graduate Secretary

(402 MacKinnon, Ext. 58966)
cids@uoguelph.ca

Administrative Staff from Agricultural Economics and Business

Graduate Co-ordinator

Spencer Henson (327 MacLachlan, Ext. 53134)

Graduate Secretary

Bertilla Moroni (311 MacLachlan, Ext. 53915)

Administrative Staff from Animal and Poultry Science

Graduate Co-ordinator

Andy Robinson (127 ANNU, Ext. 53679)

Graduate Secretary

Wendy McGrattan (144 ANNU, Ext. 56215)

Administrative Staff from Economics

Graduate Co-ordinator

Ross McKittrick (730 MacKinnon, Ext. 53532)

Graduate Secretary

Ann Bolger (723 MacKinnon, Ext. 56341)

Administrative Staff from English and Theatre Studies

Graduate Co-ordinator

Paul Mulholland (110 Massey, Ext. 53268 or 58749)

Graduate Secretary

Sharon Ballantyne (427 MacKinnon, Ext. 56315)

Administrative Staff from Geography

Graduate Co-ordinator

Bill Nickling (353 Hutt, Ext. 53529)

Graduate Secretary

Marilyn Klatt (129A Hutt, Ext. 56721)

Administrative Staff from History

Graduate Co-ordinator

Peter Goddard (325 MacKinnon, Ext. 54460)

Graduate Secretary

Barbara Merritt (345 MacKinnon, Ext. 56528)

Administrative Staff from Philosophy

Graduate Co-ordinator

Mark McCullagh (356 MacKinnon, Ext. 53221)

Graduate Secretary

Linda Stadig (348 MacKinnon, Ext. 53272)

Administrative Staff from Political Science

Graduate Co-ordinator

Janine Clark (637 MacKinnon, Ext. 52927)

Graduate Secretary

Millie MacQueen (623 MacKinnon, Ext. 53895)

Administrative Staff from Rural Extension Studies

Graduate Co-ordinator

James Mahone (142 Landscape Architecture, Ext. 56781)

Graduate Secretary

Nancy Orso (100 Landscape Architecture, Ext. 56780)

Administrative Staff from Rural Planning and Development

Graduate Co-ordinator

F. Harry Cummings (102B Landscape Architecture, Ext. 53637)

Graduate Secretary

Nancy Orso (100 Landscape Architecture, Ext. 56780)

Administrative Staff from Sociology and Anthropology

Graduate Co-ordinator

Feb. 17, 2006

Tony Winson (617 MacKinnon, Ext. 52193)

Graduate Secretary

Millie MacQueen (623 MacKinnon, Ext. 53895)

MA and MSc Programs

Students wishing to pursue an MSc or MA degree with the designation "International Development Studies" must enter the CIDS program through a participating department. Students meet both departmental and CIDS requirements. More detailed information is available in the CIDS Graduate Studies Handbook or on the CIDS Graduate website: www.uoguelph.ca/cids.

Admission Requirements

Students must meet the admission requirements of the department of their choice and demonstrate familiarity with conceptual frameworks employed in the social sciences.

Degree Requirements

Students complete CIDS core requirements and requirements designated for CIDS students by the relevant department. Following are requirements for select departments; consult the graduate calendar for other departments. One CIDS core course may be waived if a student has taken a comparable course at the senior undergraduate level.

Courses

CIDS Core*

- One of Gender and Development SOC*6460/ANTH*6460 or Development Communication REXT*6420 or Development, Community and Rurality SOC*6420/ANTH*6420 or Diversity and Social Equality SOC*6270/ANTH*6270
- One of Urbanization and Development GEOG*6400 or Political Identities, Territory and Territoriality GEOG*6450
- One of Economic Development in Historical Perspective ECON*6370 or Agriculture in Economic Development AGECE*6600 or Economic Development ECON*6350 (with permission of Instructor)
- One of Development Administration POLS*6750 or The Politics of Development and Underdevelopment POLS*6730
- International Development Studies Seminar IDEV*6100

Note

*This does not apply to students in Rural Planning and Development. Please see Rural Planning and Development section below for required courses (Both CIDS and departmental).

Optional 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 listed below.

Departmental Requirements

Programs in departments not listed below are designed by special arrangements.

Agricultural Economics and Business (MSc)

- Advanced Microeconomics ECON*3710 or Microeconomics Theory I ECON*6000
- Advanced Macroeconomic Theory ECON*4810
- One of the following:
 - Multivariate Research Methods COST*6060 or Mathematical Programming AGECE*6360 or Introduction to Econometric Methods ECON*6050
 - Agriculture in Economic Development AGECE*6600 (if not taken as part of CIDS core)
 - One additional Agricultural Economics course
 - A thesis

Note

*NB: a departmental course from the policy area may substitute for the Politics course in the CIDS core.

Anthropology (MA)

- Anthropological Theory ANTH*6080
- Qualitative Research Methods ANTH*6140
- Pro-Seminar ANTH*6700
- Either a Thesis and one additional course or ANTH*6660 Major Paper and three additional courses

Economics (MA)

- Microeconomic Theory I ECON*6000
- Macroeconomic Theory I ECON*6020
- Introduction to Econometric Methods ECON*6050 or Econometrics I ECON*6140

- Research Project ECON*6940

English (MA)

- Approaches to Research and Theory ENGL*6010
- One other English course and a thesis, or
- two other English courses and the Research Project ENGL*6803

Geography (MA)

- Research Methods GEOG*6090
- One other Geography course
- Either a thesis or GEOG*6180 Research Project plus one other Geography course

History (MA)

- Historiography I HIST*6000
- Historiography II HIST*6020
- Two additional History courses (only one if the CIDS core includes Economic Development in Historical Perspective ECON*6370)
- Either a thesis or Major Paper HIST*6400

Note

N.B. Historical Conceptions of the City HIST*6390 may substitute for the geography component of the CIDS core

Philosophy (MA)

- MA Seminar PHIL*6950
- An additional philosophy courses in consultation with the department
- Either a thesis or research paper (in conjunction with Guided Research Project PHIL*6990)

Political Science (MA)

- Proseminar POLS*6900
- Political Research: Theories and Approaches POLS*6940
- Either a thesis plus one additional course or POLS*6970 Major Paper plus two additional courses (normally from the Political Science Department)

Rural Extension Studies (MSc)

- Foundations of Capacity Building and Extension REXT*6070
- Research Methods REXT*6260
- Application of Quantitative Techniques in RPD RPD*6380 or Qualitative Analysis in Rural Development EDRD*6000
- Two additional courses from the following group
- Adult Learning and Development REXT*6060
- Interpersonal/Intercultural Communication REXT*6190
- Special Topics in Capacity Building and Extension REXT*6290
- Extension Theory and Methods REXT*6311
- Capacity Building for Sustainable Development REXT*6320
- Facilitation and Conflict Management REXT*6330
- Readings in Capacity Building and Extension REXT*6410
- Development Communication REXT*6420
- Decision Making and Conflict REXT*6690
- One additional course in other areas of research (open elective)
- A thesis or
- Major Paper REXT*6900 plus two more courses from the restricted electives group (see course list above)

Rural Planning and Development (MSc [Plan])

CIDS Core Courses Required:

- One of Gender and Development SOC/ANTH*6460 or Development Communication REXT*6420 or Development, Community and Rurality SOC/ANTH*6420
- One of Agriculture in Economic Development AGECE*6600 or Economic Development in Historical Perspective ECON*6370
- International Development Studies Seminar IDEV*6100

Departmental Requirements

- International Rural Development Planning RPD*6030
- Philosophy and Methods in Rural Planning and Development RPD*6170
- Rural Planning and Development Theory RPD*6240
- Rural Development Planning Synthesis RPD*6300
- Application of Quantitative Techniques in Rural Planning and Development RPD*6380
- A thesis or Major Paper RPD*6360 plus two additional electives

Note

N.B.: International Rural Development Planning RPD*6030 may substitute for the politics requirement in the core.

Sociology (MA)

- Sociological Theory SOC*6070
- One of the following: Quantitative Research SOC*6130 or Qualitative Methods ANTH*6140
- Proseminar SOC*6700
- Either a thesis plus one additional course or Major Paper SOC*6660 plus three additional courses

IDEV*6000 Regional Context U [0.50]

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.

IDEV*6100 International Development Studies Seminar U [0.50]

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.

IDEV*6500 Fieldwork in International Development Studies U [0.50]

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

Land Resource Science

The objective of the MSc and PhD programs in land and atmospheric science is to provide opportunities for advanced studies and research on the lower atmosphere, soil, water, surficial geological deposits, the relationships among these resources, and their management within the context of sustainable development. Cross-disciplinary research with a focus on biophysical sciences is emphasized.

Administrative Staff

Chair

Stewart Hilts (104 Richards, Ext. 52447)
shilts@lrs.uoguelph.ca

Graduate Co-ordinator

Beverley Hale (036 Richards, Ext. 53434)
bhale@lrs.uoguelph.ca

Graduate Secretary

(102 Richards, Ext. 52488)

Graduate Faculty

Emmanuelle Arnaud

BA McMaster; MSc British Columbia; PhD McMaster - Assistant Professor

Michael E. Brookfield

BSc Edinburgh, PhD Reading - Professor

Nigel Bunce

BA, MA, DPHIL Oxford - Adjunct Professor

Terry Daynard

BSc, MSc, PhD Guelph - Adjunct Professor

Kari Dunfield

BSc Calgary, MSc, PhD Saskatchewan - Assistant Professor

Leslie J. Evans

BSc Southampton, PhD Wales - Professor

Susan Glasauer

BSc, MSc California, PhD Munich - Assistant Professor

Michael J. Goss

BSc London, MSc Birmingham, PhD Reading - Professor and Chair of Land Stewardship

Beverley Hale

BSc, MSc Toronto, PhD Guelph - Associate Professor

Richard J. Heck

BSA, MSc, PhD Saskatchewan - Assistant Professor

Stewart G. Hilts

BA Western Ontario, MA, PhD Toronto - Professor and Chair

Beverley D. Kay

BSA Toronto, MSc Guelph, PhD Purdue - Professor

John D. Lauzon

BSc, MSc, PhD Guelph - Assistant Professor

Ray A. McBride

BSc (Agr), PhD Guelph - Professor

Ivan O'Halloran

BSc MSc Guelph, PhD Saskatchewan - Assistant Professor

Gary W. Parkin

BSc, MSc Western Ontario, PhD Guelph - Associate Professor

Peter van Straaten

Dipl Geol, Dr. rer nat Gottingen (Germany) - Associate Professor

R. Paul Voroney

BSc Calgary, MSc, PhD Saskatchewan - Professor

Claudia Wagner-Riddle

BSc, MSc Sao Paulo, PhD Guelph - Associate Professor

Jon S. Warland

BSc Cornell, MSc British Columbia, PhD Guelph - Assistant Professor

MSc Program

Admission Requirements

In addition to the minimum requirements stated elsewhere in the Graduate Calendar, admission to the graduate program is dependent on the availability of an advisor, space and funding.

Students entering the MSc program will be expected to have taken, or be familiar with the content of, introductory courses in atmospheric science, soil science, earth science and land resource management, either through appropriate courses or a program of self study.

Degree Requirements

All students in the MSc program are required to enroll in the two-course sequence Research Issues I and II. The objectives of these courses are to enhance the skills needed for a research career (including cross-disciplinary research); foster the development of superior

communication skills; increase the student's awareness of major issues related to land resources, and current research; and provide an environmental, social and economic context for this research. It is recommended that students enrol in the courses during their first year.

PhD Program

Admission Requirements

Students who are applying for admission to the PhD program, and who have completed an MSc in another program (at Guelph or at a different University), will follow the application procedures prescribed by Graduate Program Services. Students lacking the same level of understanding across fields and within fields as graduates from the MSc program will be expected to correct this deficiency early in their PhD program.

Students intending to continue directly into a PhD program after the completion of an MSc within the program must complete a full application for the PhD degree. This application should be submitted at least two months before meeting the requirements of the MSc degree. Superior MSc students may be permitted to transfer to the PhD program without completing the master's degree.

Degree Requirements

Students must pass a qualifying examination and successfully prepare and defend a thesis, as specified under the general regulations for the PhD degree. Students must complete Research Issues I, LRS*6900, and Research Issues II, LRS*6910, as the minimum course requirements. Additional courses will be determined by the advisory committee.

Students are encouraged to develop an advanced level of understanding of two or more additional areas of specialization which are related to the area of their research and to participate in cross-disciplinary or collaborative research programs where opportunities permit.

Interdepartmental Programs

Toxicology Program

Land Resource Science participates in the interdepartmental program in Toxicology. Students register in both the department and the collaborative program.

Courses

Atmospheric Science

LRS*6000 Physical Environment of Crops and Forests F [0.50]

Recent literature on temperature, humidity, radiation, wind, gases and particles in crop and forest environments; evapotranspiration and photosynthesis of plant communities; modification of microclimates; applied micrometeorology. Offered in even-numbered years.

LRS*6040 Micrometeorology W [0.50]

Exchanges of mass, momentum and energy between the surface and the atmosphere will be studied in the context of larger-scale meteorology. Diffusion and turbulence in and above plant canopies will be examined from theoretical and practical perspectives. Topics include time-series analysis, micrometeorological measurement theory, and basic principles of atmospheric science. Offered in even-numbered years.

LRS*6060 Agrometeorological Instrumentation W [0.50]

Theoretical and practical aspects of electronic circuits, sensors, and equipment used in agrometeorological research. Offered in odd-numbered years.

LRS*6241 Special Topics in Atmospheric Science F,U [0.25]

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.

LRS*6242 Special Topics in Atmospheric Science F,U [0.50]

See LRS*6241 above.

Soil Science

LRS*6250 Soil Genesis and Classification F [0.50]

A discussion of world soil regions for students not specializing in soil genesis.

LRS*6280 Soil Physics F [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.

LRS*6300 Applied Soil Physics F [0.50]

The application of soil physical principles to practical problems concerning soil physical quality, erosion, land reclamation and industrial-waste disposal on land

Prerequisite(s): SOIL*3070.

LRS*6320 Non-equilibrium Thermodynamics of Porous Media W [0.50]

Transport processes in porous media such as soils, clays, and membranes are dealt with in the framework of non-equilibrium thermodynamics with emphasis on the coupling between water, solutes, heat and electric charge transport. Offered in alternate years.

LRS*6340 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.

LRS*6360 Soil and Water Chemistry F [0.50]

Thermodynamics of soil solutions; solution-solid phase equilibria; reaction kinetics; computer modelling of solute-mineral interactions.

LRS*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.

LRS*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.

LRS*6420 Soil Productivity F [0.50]

Soil physical, chemical and biological characteristics as they influence crop growth with emphasis on processes and mechanisms.

LRS*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. (alternate years)

LRS*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.

LRS*6582 Special Topics in Soil Science U [0.50]

See LRS*6581 above.

Environmental Earth Science**LRS*6280 Soil Physics F [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.

LRS*6360 Soil and Water Chemistry F [0.50]

Thermodynamics of soil solutions; solution-solid phase equilibria; reaction kinetics; computer modelling of solute-mineral interactions.

LRS*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.

Land Resources Management**LRS*6760 Advanced Remote Sensing W [0.50]**

Critical review of the latest research papers on the use of remotely sensed data for temporal monitoring of the biosphere.

LRS*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.

LRS*6882 Special Topics in Land Resources Management U [0.50]

See LRS*6881 above.

Other**LRS*6900 Research Issues I F [0.25]**

Principles and philosophy of scientific research including the development of superior communication skills.

LRS*6910 Research Issues II W [0.25]

A continuation of Research Issues I.

LRS*6941 Analytical Instrumentation and Techniques U [0.25]

Equipment and techniques of soil and plant analyses. Variable credit will be assigned based on the number of laboratory units covered.

LRS*6942 Analytical Instrumentation and Techniques U [0.50]

See LRS*6941 above.

Landscape Architecture

The Landscape Architecture program offers courses of study leading to the Master of Landscape Architecture (MLA) degree.

Administrative Staff

Director

John FitzGibbon (103B Landscape Architecture, Ext. 56784)
jfitzgib@uoguelph.ca

Graduate Co-ordinator

Cecelia Paine (121 Landscape Architecture, Ext. 52521)
cpaine@uoguelph.ca

Graduate Secretary

Diana Foolen (100 Landscape Architecture, Ext. 56576)
dfoolen@uoguelph.ca

Graduate Faculty

Robert D. Brown

BSc Saskatchewan, MLA, PhD Guelph, CSLA, SALA, ASLA - Professor

Robert Corry

BLA Guelph, MLA Minnesota, PhD Michigan - Assistant Professor

John E. FitzGibbon

BA McMaster, MSc Wales, PhD McGill, MCIP, RPP - Professor

Larry B. Harder

BES Manitoba, MLA Harvard - Associate Professor

Karen Landman

BLA, MSc Guelph, PhD Queen's, OALA, OPPI - Assistant Professor

Maurice Nelischer

BSc Carleton, MLA Guelph, CSLA, OALA - Associate Professor

Cecelia Paine

BLA Illinois, MLA Michigan, FCSLA, OALA, ASLA - Associate Professor

Nathan H. Perkins

BLA, MLA Illinois, PhD Wisconsin (Madison), ASLA - Associate Professor

Nancy Pollock-Ellwand

BLA Guelph, MArch Manitoba, PhD Waterloo, CSLA, OALA, ASLA - Associate Professor

James R. Taylor

BSLA Iowa State, MLA California, FCSLA, OALA, FASLA - 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/sedrd/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:

LARC*6380	Research Seminar
LARC*6600	Critical Inquiry and Research Analysis
LARC*6610	Research Methods
LARC*6710	Special Study
1 Elective	
Thesis	

For the holder of a BLA without such professional experience

LARC*6380	Research Seminar
LARC*6430	Landscape Resource Analysis
LARC*6470	Integrative Environmental Planning
LARC*6600	Critical Inquiry and Research Analysis
LARC*6610	Research Methods

2 Electives

Thesis

For holders of degrees other than the BLA:

HORT*3260	Woody Plants (audit)
LARC*6010	Landscape Architecture Studio I
LARC*6020	Landscape Architecture Studio II
LARC*6030	Landscape Architecture Studio III
LARC*6040	Landscape Architecture Studio IV
LARC*6120	Advanced Design
LARC*6370	Graduate Seminar
LARC*6380	Research Seminar
LARC*6430	Landscape Resource Analysis
LARC*6470	Integrative Environmental Planning
LARC*6440	Plants and Environment
LARC*6600	Critical Inquiry and Research Analysis
LARC*6610	Research Methods
LARC*6710	Special Study

Thesis

Interdepartmental Programs

Rural Studies PhD Program

Landscape Architecture participates in the PhD program in Rural Studies in the field of sustainable rural communities. 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

Design and Synthesis

LARC*6010 Landscape Architecture Studio I F [0.50]

Integrated field and studio instruction introduces the student to landscape architecture through acquisition of basic skills and knowledge. Topics include history, site surveying, landscape inventory and analysis, site design, graphic communication, introductory design, sculpture, and model building.

LARC*6020 Landscape Architecture Studio II F [0.50]

Integrated field and studio instruction, and case studies leads the student through advanced site design, basic materials and techniques, design theory, and design principles.

Prerequisite(s): Students are required to satisfy a woody plants requirement either through the course HORT*3260 or equivalent.

LARC*6030 Landscape Architecture Studio III W [0.50]

Integrated field and studio instruction emphasizes design concept formulation, visual communication, computer application in design, and introductions to urban and rural greenways design, community design, facilitation, and presentation.

LARC*6040 Landscape Architecture Studio IV W [0.50]

Integrated field and studio instruction emphasizes design implementation, materials, construction, specifications, and professional practice.

LARC*6120 Advanced Design W [0.50]

Theory, methods and practice in site planning and design, human settlement, and planting design. Projects typically address open space design, conservation and community design at the small and intermediate scale in urban, suburban or rural settings. Case study component will include some travel at the student's expense.

Theory and Practice

LARC*6370 Graduate Seminar F,W [0.25]

A seminar course emphasizing the development of oral and writing skills.

Interdisciplinary

LARC*6380 Research Seminar W [0.25]

A capstone course whose content is directed by the research of the participants. Participants will organize a conference at which they will present their research results.

Bio-Physical Processes and Resources: Criteria for Planning/Design

LARC*6430 Landscape Resource Analysis F [0.50]

Integrated field and classroom instruction introduces the student to inventory and analysis of biological, physical, social and cultural elements of the landscape. Projects will incorporate principles of landscape ecology and landscape planning. Field study will require some travel at student's expense.

LARC*6440 Plants and Environment F [0.50]

This course integrates field and classroom study to apply landscape ecology to current landscape problems, including analysis of regional landscapes, restoration of degraded landscapes, and application of aesthetic and ecological principles across scales in site to regional settings. Case studies component will require some travel at students' expense.

LARC*6470 Integrative Environmental Planning W [0.50]

Landscape planning emphasizing the integration and interrelationships between biophysical and cultural resources, with application at a regional landscape planning scale. This course typically incorporates community-outreach projects and develops student facilitation abilities.

Tools and Techniques**EDRD*6000 Qualitative Analysis in Rural Development U [0.50]**

Nature and use of qualitative data collection and analysis techniques by practitioners in the planning, implementation and evaluation of rural planning and development activities in both domestic and international settings.

Prerequisite(s): RPD*6170 or REXT*6260 or LARC*6610

LARC*6600 Critical Inquiry & Research Analysis W [0.50]

Students are introduced to critical inquiry as a method of evaluating information, design, and planning. The focus of the course is on the quantification and analysis of research data. Modelling and simulation are introduced and discussed in the context of planning, design, and research.

LARC*6610 Research Methods F [0.50]

An introduction to a broad array of research methods as they apply to landscape planning and design. The focus of the course is on the connections between research and design and is context-based learning. The emphasis is on developing foundations for the creation of appropriate research questions.

RPD*6170 Philosophy and Methods in Rural Planning and Development Research U [0.50]

The course provides rural planning and development professionals with a number of theoretical frameworks and practical approaches to problem solving in rural Canadian and international contexts. The course content provides an introduction to hypothesis development, data collection, analytical frameworks, research management, and information synthesis and presentation methodologies that are appropriate to the practicing rural planner and developer. It views the roles of the researcher and research as interventionist and intervention in the rural community. Research methods are discussed as an integral and supporting part of the planning and development process.

Independent Study**LARC*6710 Special Study S,F,W [0.50]**

Independent study. A proposal for the content and product required for this course must be developed in conjunction with the student's Advisory Committee.

Leadership

Administrative Staff

Director of Graduate Programs of the Faculty of Management

Ralph Sykes (150 Research Lane, Suite 205, Ext. 56630)

rsykes@uoguelph.ca

Graduate Co-ordinator

Michael Cox (308 HTM, Ext. 56597)

mcox@uoguelph.ca

Graduate Secretary

Kim Mitz (105 Macdonald Institute, Ext. 53415)

kmitz@uoguelph.ca

Graduate Faculty

Michael Cox

CD Naval Officer Program, MA Western Washington, PhD Union (Ohio), MCIM Chartered Institute of Marketing Management - Assistant Professor

Serge Desmarais

BA, MA, PhD Waterloo - Associate Professor

Brian M. Earn

BA Manitoba, MA, PhD Toronto - Professor

Peter Hausdorf

BSc McMaster, MA Guelph, PhD McMaster - Assistant Professor

Stephen Lynch

BA, BEd Toronto, MA Duquesne, MSc California American, PhD Bradford - Assistant Professor

Timothy Mau

BA, MA Guelph, D Phil Oxford - Assistant Professor

Ralph Sykes

Dip Ag Guelph, BA Royal Military College, MBA York, FCA Institute of Chartered Accountants of Ontario - Associate Professor, Director, Graduate Programs

John Walsh

BA Thames Polytechnic, MBA, PhD Western Ontario - Professor

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 three one-week residency programs and the completion of a major research project.

Admission Requirements

Admission as a student is granted, on recommendation of the Faculty of Management, to:

- i. The holder of an honours baccalaureate or its equivalent (from a recognized university or college) with an average standing of at least a "B" in the last four semesters or the last two undergraduate years (full-time or equivalent). Normally, at least five years of work experience involving leadership opportunity is required.
- ii. The holder of: - a general degree and/or; - a community college diploma and/or; - an acceptable professional designation, having completed at least seven years of work experience involving leadership opportunity.

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 Faculty of Management Office of Graduate Programs. 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 25 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 four years of commencement.

The MA (Leadership) involves a challenging combination of course work and a research-based project. Six web-based courses (3.0 credits) and two residency courses (1.0 credit) must be completed, followed by the major research project (1.0 credit). Faculty and senior executives at the participant's workplace often jointly supervise the research project. The project requires a literature review, data collection, data analysis, and culminates in a major paper that is presented to faculty and other program participants.

Courses

LEAD*6000 Foundations of Leadership S [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.

LEAD*6100 Theories of Leadership F [0.50]

This course traces the development of the concept of leadership. Through the interplay of theory and practical application, participants will gain a deeper appreciation for the requirements, responsibilities, and consequences of effective leadership.

LEAD*6200 Leadership of Organizational Change F [0.50]

This course studies the role of leadership in the management of change within an organization and the changes required of management. The course examines the development of trust, the building of organizational loyalty, and motivation and inspiring of high performance teams.

LEAD*6300 Role of the Leader in Decision-Making W [0.50]

The role of the leader in decision-making is explored through the study of the rational model for decision-making, human biases, creativity, and risk and uncertainty in decision-making. The course will also examine ethical issues and group decision-making.

LEAD*6400 Research Methods for Decision-Making W [0.50]

The course will explore both quantitative and qualitative techniques used in the analysis of research results from a variety of sources (surveys, government statistics, in-depth interview, focus groups and program evaluation results). Case studies will be used to demonstrate the application of multiple research methods.

LEAD*6500 Ethics in Leadership F [0.50]

Issues in the use and application of ethical standards by leaders are explored through examples from history, current events, novels, films and television. Relevant theory is applied to leadership examples to help students develop an ethical framework for the exercise of leadership skills.

LEAD*6720 Politics of Organizations F [0.50]

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.

LEAD*6800 Personal Skill Self-Assessment S [0.50]

Using the "Basis of Competence" model, this course examines personal skills in four areas: Managing Self, Communicating, Managing People and Tasks, and Mobilizing Innovation and Change. The skills required to make smooth transitions from one job to another in a dynamic workplace will be explored.

LEAD*6900 Major Research Project W-S [1.00]

This course involves a directed research project leading to a referenced, professional report on a leadership problem or issue. Completion of this course will require formal presentation on the research, analysis, evaluation and recommendations to faculty and students.

Literary Studies/Theatre Studies in English

Administrative Staff

Co-Director - Laurier

Christl Verduyn (Wilfrid Laurier University, Ext. 2894)
cverduyn@wlu.ca

Co-Director - Guelph

Paul Mulholland (University of Guelph, Ext. 58749)
pmulholl@uoguelph.ca

Graduate Secretary - Laurier

Joanne Buchan (Wilfrid Laurier University, Ext. 3257)
jbuchan@wlu.ca

Graduate Secretary - Guelph

Sharon Ballantyne (University of Guelph, Ext. 56315)
sballant@uoguelph.ca

Graduate Faculty

Christine Bold

MA Edinburgh, PhD University College London - Professor

Dionne Brand

BA, MA Toronto - Professor and University Research Chair

Susan I. Brown

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

Elaine Chang

BA UBC, AM, PhD Stanford - Assistant Professor

Michelle Elleray

BA Victoria (Wellington), MA Auckland, MA, PhD Cornell - Assistant Professor

Alan D. Filewod

BA York, MA Alberta, PhD Toronto - Professor

Daniel Fischlin

BFA, MA Concordia, PhD York - Professor

Ajay Heble

BA Innis College (Toronto), MA Dalhousie, PhD Toronto - Professor

Helen Hoy

BA, MA, PhD Toronto - Professor

Smaro Kamboureli

BA Aristotelian, MA, PhD Manitoba - Professor

Michael H. Keefer

BA Royal Military College, MA Toronto, DPhil Sussex - Associate Professor

Thomas King

BA, MA Chico State, PhD Utah - Professor

Ric Knowles

BA, MA, PhD Toronto - Professor

Janice Kulyk Keefer

BA Toronto, MA, DPhil Sussex - Professor

Mark Lipton

BA Concordia, MA, PhD New York - Assistant Professor

Paul A. Mulholland

BA, MA Toronto, PhD Birmingham - Associate Professor

Martha J. Nandorfy

BA, MA Ottawa, PhD Toronto - Associate Professor

Daniel O'Quinn

BSc, MA Western, PhD York - Associate Professor

Tedra Osell

BA Washington, MA Nebraska, PhD Washington - Assistant Professor

Donna Palmateer Pennee

BA, MA Guelph, PhD McGill - Professor and Associate Dean of Arts and Social Sciences

Stephen D. Powell

BA Oberlin College, MA Indiana (Bloomington), PhD Toronto - Associate Professor

Pablo Ramirez

BA Yale; MFA Miami; MA, PhD Michigan - Assistant Professor

Jennifer Schacker

BA McGill, MA, PhD Indiana - Assistant Professor

Alan Shepard

BA St. Olaf College, PhD Virginia - Professor

J.R. (Tim) Struthers

BA, MA, PhD Western Ontario - Associate Professor

Ann Wilson

BA, MA, PhD York - Associate Professor

Graduate Faculty from Wilfrid Laurier University

Andrea Austin

BA, MA, PhD Queen's - Assistant Professor

Viviana Comensoli

BA, MA Simon Fraser, PhD UBC - Professor

Maria DiCenzo

BA McMaster, MA Queen's, PhD McMaster - Associate Professor

Tamas Dobozy

BA Victoria, MA Concordia, PhD British Columbia - Assistant Professor

Philippa Gates

BA Toronto, MA, PhD Exeter - Assistant Professor

Edwin Jewinski

BA, MA Waterloo, PhD Toronto - Professor

Michael Moore

BA, MA Carleton, PhD Queen's - Professor

Leslie O'Dell

BA Queen's, MA, PhD Toronto - Associate Professor

Anne Russell

BA Trent, MA, PhD York - Associate Professor

Lynn Shakinovsky

BA Witwatersrand, MA, PhD Toronto - Associate Professor

Paul Tiessen

BA Laurier, MA, PhD Alberta - Professor

Eleanor Ty

BA Toronto, MA, PhD McMaster - Professor

Christl Verduyn

BA Trent, MA, PhD Ottawa - Professor

Robin Waugh

BA, MA Manitoba, PhD Queen's - Associate Professor

James Weldon

BA, MA New Brunswick, PhD Queen's - Associate Professor

Julia Wright

BA, MA, PhD Western - Associate Professor and Canada Research Chair

PhD Program

Admission Requirements

Admission to the Joint PhD Program normally requires an MA in English, an MA in Drama/Theatre, or an equivalent degree with at least an A- average in graduate work. Applications are considered by the Joint PhD Program Committee and a recommendation to admit or decline is forwarded to the Dean of Graduate Studies at the proposed home university.

Program Requirements

Although students might choose either Literary Studies or Theatre Studies, innovative opportunities exist in the program to pursue work across these traditional disciplinary boundaries. The degree requirements consist of three one-semester (0.5 credit) graduate courses normally taken in the first year of the program; one general area seminar (0.5 credit) culminating in a written candidacy exam and a colloquium presentation; one intensive area seminar (1.0 credit) culminating in an oral and written candidacy exam; and a dissertation (2.0 credits). For purposes of the Joint PhD Program, the qualifying examination related to the student's knowledge of the subject area and field shall consist of the oral and written candidacy exam for the intensive area seminar.

Area Seminars

The area seminars are structured directed-reading courses in two different fields, intended to provide concentrated training in the student's expected areas of research concentration and preparation for the written examination at the conclusion of each area seminar. The seminars involve regular consultations between the student and the seminar director. The general area seminar will normally be taken during the second and third semesters of the program (year one). The intensive area seminar will normally be taken in the fourth and fifth semesters of the program and will culminate in the oral candidacy examination (year two).

General Area Seminar (Year One)

The general area seminar explores an area in a field other than that in which the student has chosen to specialize and write a dissertation. The seminar emphasizes thorough general knowledge of the area's scope, relevant theoretical frameworks, and research methodologies, with due regard to the student's own teaching, research interests, and critical perspectives. The reading and other activities proceed in close consultation with an advisory committee consisting of an assigned area seminar director (who will normally be a faculty member other than the anticipated dissertation advisor) and two other faculty members. The area seminar director is selected from the core faculty in the student's resident institution, while the two faculty members may be from one or both institutions. This advisory committee, together with the PhD Director from the student's home university, comprises the student's candidacy examination committee.

Intensive Area Seminar (Year Two)

The intensive area seminar involves individualized, directed study of the immediate literary, cultural, and theoretical contexts of the student's approved dissertation subject. Ordinarily, the assigned seminar director is the confirmed dissertation advisor. Two additional faculty members serve in an advisory capacity, and together with two additional members of the graduate faculty (at least one of whom must be a member of the unit), plus the appropriate PhD Director or the chair of the academic unit, form the candidacy examination committee. The intensive area seminar ensures that the student's dissertation work is supported by a broad and contextualized understanding of the primary materials associated with the area of specialization and dissertation.

Both the written and oral examinations for the intensive area seminar shall constitute the qualifying candidacy examination. Upon satisfactory completion of these examinations the student is deemed to have met the Joint PhD Program standards and becomes a candidate for the PhD degree.

Progress Reports

At the end of the first year of registration (usually in May) and once a year thereafter, a student is required to complete an annual research progress report detailing the achievements of the previous year and the objectives for the next year. The report must demonstrate satisfactory progress, and must be signed with comments by the advisor and PhD Director from the student's home university, and filed with both the program director and the Graduate Studies Office of the home university. Failure to submit a satisfactory report may result in the student being required to withdraw from the program.

PhD Dissertation

Following successful completion of the two Area Seminars, 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 will assume the primary advisory role. The dissertation should normally be between 50,000 and 75,000 words in length. The regulations and procedures at the university in which the student is registered will govern both the dissertation and the examination formats.

Language Requirement

Students will be required to demonstrate reading knowledge of one language other than English, as approved by the Joint PhD Program Committee. Assessment of the student's reading knowledge will be based on the student's translation (with the help of a dictionary) of a critical passage, and a written analysis (in English) of the passage's critical implications. Evidence that a student has already demonstrated similar language ability at another university prior to admission may be submitted to the Joint PhD Program Committee with a request to have the language requirement waived. Credit will be given to any student who has fulfilled the language requirement through an MA-level examination. Credit will not normally be given for the completion of a university-level language course.

Typically the language requirement will be completed by the end of the fifth semester of study, and no later than the sixth semester (year two). A student who fails the language examination twice will normally be required to withdraw from the program.

Residency Regulations

At least five semesters of full-time study must be devoted to the doctoral program following the completion of a recognized Master's degree.

Courses**LTS*7770 Language Requirement U [0.00]**

A written demonstration of a student's reading knowledge of one language other than English, as approved by the Joint PhD Program Committee.

LTS*7800 General Area Seminar U [0.50]

A directed-reading course to provide concentrated training in an area of research other than the student's expected area of research concentration. This seminar emphasizes thorough general knowledge of a chosen area's scope, theoretical frameworks, and research methodologies. The course is normally taken during the first year of a student's program.

LTS*7820 Intensive Area Seminar U [1.00]

A reading course intended to provide concentrated training in the student's expected area of research concentration. This seminar involves individualized, directed study of the immediate literary, cultural, and theoretical contexts of the student's approved dissertation subject. The course is normally taken in the second year of a student's PhD program.

LTS*7900 Directed Studies U [0.50]

The study of a special topic under the guidance of a member of the graduate faculty.

LTS*7990 Doctoral Dissertation U [2.00]

Submission and defense of an acceptable thesis, written by the PhD 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.

Courses Offered at the University of Guelph*

DRMA*6020 Canadian Drama in English

DRMA*6040
DRMA*6050
DRMA*6060
DRMA*6080
DRMA*6090
DRMA*6100
DRMA*6120
DRMA*6130
DRMA*6140
DRMA*6150
DRMA*6180
DRMA*6190
DRMA*6220
DRMA*6801
DRMA*6802
ENGL*6002
ENGL*6003
ENGL*6201
ENGL*6209
ENGL*6412
ENGL*6421
ENGL*6431
ENGL*6441
ENGL*6451
ENGL*6611
ENGL*6621
ENGL*6641
ENGL*6691
ENGL*6811
ENGL*6801
ENGL*6802

Quebec and Franco-Canadian Drama
Special Studies in Canadian Drama
Aspects of Canadian Theatre History
Special Studies in Canadian Theatre
Aspects of Theatre in Early-Modern England
English Drama to 1642
Aspects of 20th-Century Theatre
Aspects of 19th-Century Drama
Aspects of 20th-Century Drama
Special Studies in Theatre History
Aspects of 19th Century Theatre
Special Studies in Drama
Aspects of the Theory of Drama, Theatre, and Performance
Reading Course I
Reading Course II
Topics in the History of Criticism
Problems of Literary Analysis
Topics in Canadian Literature
Topics in Commonwealth/Postcolonial Literature
Topics in Medieval/Renaissance Literature
Topics in 18th-Century and Romantic Literature
Topics in 19th-Century Literature
Topics in Modern British Literature
Topics in American Literature
Topics in Women's Writing
Topics in Children's Literature
Topics in Scottish Literature
Interdisciplinary Studies
Special Topics in English
Reading Course I
Reading Course II

Note

* N.B. all courses, except for the Intensive Area Seminar and the Dissertation, are weighted 0.5.

Courses Offered at Wilfrid Laurier University*

WLU*600E
WLU*601E
WLU*602E
WLU*603E
WLU*604E
WLU*605E
WLU*606E
WLU*607E
WLU*608E
WLU*610E
WLU*621E
WLU*622E
WLU*623E
WLU*624E
WLU*625E
WLU*626E
WLU*628E
WLU*629E
WLU*630E
WLU*632E
WLU*634E
WLU*635E
WLU*636E
WLU*640E
WLU*641E
WLU*642E
WLU*690E
WLU*691E
WLU*692E

Research Methods, Theory, and Professional Issues
Fiction by Contemporary British Women
Gender and Genre in Renaissance Drama
American Women Writers
The Gender of Modernism
Representations of Gender in Victorian Literature
Theatrical Images of Gender
Ideologies of Genre in 19th-Century Literature
Women Writers of the 17th Century
Feminist Theory and Women's Writing
The Nature Lyric: Genre and Gender
British Feminist Drama in the 20th Century
Film Genre and Feminist Theory
Medieval Dream Vision Narrative
Medieval Romance
Postcoloniality: Theory and Practice
The Dramatic Experience
Canadian Documents and Canadian Poems
Modernism to Postmodernism
Renaissance Domestic Tragedy
Dramatic Comedy of the 17th Century
The Gothic
Canadian Literary Pluralities
Reading Theory
Voices of the Diaspora
Oral Performance and Oral Theory
Directed Studies
Special Topics in Gender
Special Topics in Genre

Note

* N.B. All courses, except for the Intensive Area Seminar and the Dissertation, are weighted 0.5.

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

Acting Chair

Joseph Cunsolo (547 MaNaughton, Ext. 53033/52155)
jcunsolo@uoguelph.ca

Graduate Co-ordinator: Mathematics

Herman Eberl (508 MacNaughton, Ext. 52622/52155)
heberl@uoguelph.ca

Graduate Co-ordinator: Statistics

Gerarda Darlington (514 MacNaughton, Ext. 53292/52155)
gdarlingr@uoguelph.ca

Graduate Secretary

Susan McCormick (535 MacNaughton, Ext. 56553/52155)
smccormi@uoguelph.ca

Graduate Faculty

O. Brian Allen

BSc, MSc Guelph, PhD Cornell - Professor and Chair

Daniel A. Ashlock

BSc Kansas, PhD California Institute of Technology - Associate Professor

R. Ayeshya Ali

BSc Western Ontario, MSc Toronto, PhD Washington - Assistant Professor

Chris Bauch

BSc Texas, PhD Warwick - Assistant Professor

Edward M. Carter

BSc, MSc, PhD Toronto - Professor

Eleanor Chu

BSc National Taiwan, BSc, MSc Acadia, M. Math, PhD Waterloo - Professor

Monica Cojocar

BA, MSc Bucharest, PhD Queen's - Assistant Professor

Joseph Cunsolo

BA McMaster, MA Waterloo, PhD Toronto - Associate Professor

Gerarda Darlington

BSc, MSc Guelph, PhD Waterloo - 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. - Assistant Professor

Stephen Gismondi

BSc, MSc, PhD Guelph - Assistant Professor

John D. Holt

BSc, MA Toronto, PhD Waterloo - Associate Professor

Julie Horrocks

BSc Mount Allison, BFA Nova Scotia College of Art & Design, MMath, PhD Waterloo - Assistant Professor

Peter T. Kim

BA Toronto, MA Southern California, PhD California (San Diego) - Professor

David Kribs

BSc Western, MMath, PhD Waterloo - Assistant Professor

Herb Kunze

BA, MA, PhD Waterloo - Associate Professor

Anna T. Lawniczak

MSc Wroclaw, PhD Southern Illinois - Professor

Hristo Sendov

BA Sofia Univ. Bulgaria, MSc Michigan Technological Univ, PhD Waterloo - Assistant Professor

Radhey S. Singh

BA, MA Banaras, MS, PhD Michigan State - Professor

Gary J. Umphrey

2004-2006 University of Guelph Graduate Calendar

BSc, MSc Guelph, PhD Carleton - Assistant Professor

Allan Willms

BMath, MMath Waterloo, PhD Cornell - 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

A candidate for the MSc Degree Program must possess at least one of the following:

- a specialized honours degree (BSc or BA) in the intended area of specialization
- an honours degree with an equivalent to a major in the intended area of specialization.
- an honours degree with the equivalent of a minor in mathematics or in statistics as defined in the University of Guelph Undergraduate Calendar. The student must take sufficient courses to satisfy the requirements (or their equivalents) of a major in the intended area of specialization normally during the first two semesters of the program. These courses must be taken in addition to those described below. Students are generally not expected to undertake graduate courses before effectively completing the requirements of the undergraduate major.

An applicant who does not meet one of these requirements must register as a nondegree undergraduate student and take courses to achieve an equivalent to one of the above. Such students are encouraged to consult the departmental graduate officers or the chair of the department. The department's diploma in applied statistics fulfils 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 of MSc Project in Mathematics, MATH*6998 or MSc Project in Statistics, STAT*6998.

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 co-ordinator. 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 three of the following core courses:

MATH*6011	Dynamical Systems I
MATH*6021	Optimization I
MATH*6400	Numerical Analysis I
MATH*6041	Partial Differential Equations I

Statistical Area of Emphasis

All candidates for the MSc with a statistical area of emphasis are required to include in their program of study the following core courses:

STAT*6801	Advanced Data Analysis I
STAT*6802	Advanced Data Analysis II
STAT*6860	Linear Statistical Models

It is recommended 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

A candidate for the PhD degree program must possess a recognized master's degree obtained with high academic standing. Also, 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. Depending upon the student's academic background, further courses may be prescribed. The required four courses must include at least two core courses selected from:

MATH*6012	Dynamical Systems II
MATH*6022	Optimization II
MATH*6410	Numerical Analysis II
MATH*6042	Partial Differential Equations II

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. In addition to the courses, the student will be required to participate in the Graduate Seminar and make one oral presentation in each year of full-time enrolment.

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*6802	Advanced Data Analysis II
STAT*6860	Linear Statistical Models

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. In addition to the courses, the student will be required to participate in the Graduate Seminar and make one oral presentation in each year of full-time enrolment.

Interdepartmental Programs

Biophysics MSc/PhD Program

The Department of Mathematics and Statistics participates in the MSc/PhD programs in biophysics. Professors Bauch, Eberl, Langford, Lawniczak, and Willms are members of the Biophysics Interdepartmental Group (BIG). These faculty members' research and teaching expertise includes aspects of biophysics. Professors Bauch, Eberl, Lawniczak, and Willms may serve as advisors for MSc and PhD students in biophysics. Professor Langford may serve as co-advisor. Please consult the Biophysics listing for a detailed description of the graduate programs offered by the Biophysics Interdepartmental Group.

Toxicology MSc/PhD Collaborative Program

The Department of Mathematics and Statistics participates in the MSc/PhD programs in toxicology. Professor Hubert is a member of the Toxicology Interdepartmental Group. This faculty member's research and teaching expertise includes aspects of toxicology; he may serve as advisor for MSc and PhD students in toxicology. Please consult the Toxicology listing for a detailed description of the MSc/PhD collaborative program.

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.

MATH*6051 Mathematical Modelling U [0.50]

Selected advanced topics in mathematical modelling, possibly in conjunction with the departmental Mathematics and Statistics Clinic.

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*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]

Statistics

STAT*6700 Stochastic Processes U [0.50]

The content of this course is to introduce Brownian motion leading to the development of stochastic integrals thus providing a stochastic calculus. The content of this course will be delivered using concepts from measure theory and so familiarity with measures, measurable spaces, etc., will be assumed.

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 Advanced Data Analysis I U [0.50]

Residual analysis, deletion residuals, influential points, added variable plots, constructed variables, families of transformations, jackknife and bootstrap methods, local linear regression, regression splines and cubic smoothing splines.

STAT*6802 Advanced Data Analysis II U [0.50]

Generalized linear and generalized additive models, linear and nonlinear mixed effects models, parametric and semiparametric analysis of longitudinal and clustered data, generalized estimating equations, applications to categorical and spatial data.

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*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*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]

Note

*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.

Microbiology

The Microbiology Graduate Program offers MSc and PhD degrees. The four major areas of emphasis and the faculty associated with those areas are:

- **Microbial Physiology and Structure** -- Beveridge, Clarke, Forsberg, Krell, Lam, Meng, Mutharia, Preston, Seah, van der Merwe, Whitfield, Wood
- **Pathogenesis and Immunity** -- Kaushik, Lam, Lo, Mutharia, Preston, Seah, Stevenson, Whitfield, Wood
- **Virology** -- Krell, Meng
- **Biotechnology** -- Beveridge, Clarke, Forsberg, Kaushik, Krell, Lam, Lo, Mutharia, Seah, Stevenson, Whitfield, van der Merwe

As a result of the reorganization in the College of Biological Science, there is a further field of **Biochemistry**. This is described in detail under the Molecular Biology and Genetics Graduate Program. The faculty associated with this research area are: Brauer, Coppolino, Dawson, Josephy, Keates, Mangroo, Merrill, Sharom

Interdepartmental programs are available for students wishing to specialize in toxicology, biophysics and aquaculture.

Administrative Staff

Chair

Chris Whitfield (1252 Science Complex, Ext. 53361)
cwhitfie@uoguelph.ca

Graduate Co-ordinator

Stephen Seah (4250 Science Complex, Ext. 56750)
sseah@uoguelph.ca

Graduate Secretary

Carol V. Schlaht (1250 Science Complex, Ext. 53815)
cschlaht@uoguelph.ca

Graduate Faculty

Terry J. Beveridge

BSc, MSc Toronto, PhD Western Ontario - Professor

Manfred Brauer

BSc Calgary, MSc, PhD Wisconsin - Associate Professor

Anthony J. Clarke

MSc, PhD Waterloo - Professor

Marc Coppolino

BSc Waterloo, MSc, PhD Toronto - Assistant Professor

John Dawson

BSc Wilfrid Laurier, PhD Alberta - Assistant Professor

Cecil W. Forsberg

BSA, MSc Saskatchewan, PhD McGill - Professor

David Josephy

BSc Toronto, PhD British Columbia - Professor

Azad Kaushik

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

Robert Keates

BA Cambridge, PhD Glasgow - 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

Devakanand Mangroo

BSc, PhD McMaster - Assistant Professor

Baozhong Meng

BSc, MSc Hebei Agricultural Univ. (China), PhD Cornell - Assistant Professor

Rod Merrill

BSc Lethbridge, PhD Ottawa - Professor

Lucy M. Mutharia

BSc, MSc Nairobi, PhD British Columbia - Associate Professor

Andrew Preston

BA, D.Phil. Oxford - Assistant Professor

Stephen Y.K. Seah

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

Frances Sharom

BSc Guelph, PhD Western Ontario - Professor

Rosalynn M.W. Stevenson

BSc, PhD Manitoba - Associate Professor

George van der Merwe

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

Christopher Whitfield

BSc Newcastle, PhD Edinburgh - Professor

Janet M. Wood

BSc Victoria, PhD Edinburgh - Professor

MSc Program

Admission Requirements

The minimum requirement for admission to the MSc program is a baccalaureate in an honours science program, or the equivalent, from a recognized university or college. The applicant should have achieved an average standing of at least second class honours ('B' or 73%) during the last two undergraduate years. Admission to the program is not restricted to those holding an honours baccalaureate degree in microbiology.

Degree Requirements

Students must complete at least the minimum university course credit requirements including the departmental seminar requirements. The MSc thesis is intended to give the student training and experience in:

- a comprehensive library search on a specific topic related to the research;
- research techniques;
- the design of experiments in collaboration with the research advisor;
- the interpretation of data, and
- writing for scientific publication.

The thesis research should involve experimentation not previously reported in the literature and should lead to a complete study. Whenever possible, the results should yield publishable data, but this is not an absolute requirement for the completion of an MSc program.

In the case of a student considering transfer from the MSc program to the PhD program, it is important that the research project be one which can be expanded in scope and challenge if the transfer is approved.

PhD Program

Admission Requirements

Admission to the PhD program normally requires at least honours ('B' or a 73% average), in a recognized baccalaureate program as well as a recognized MSc degree. Transfer from the MSc program to the PhD program will be considered for a student who has achieved excellent standing at the honours baccalaureate level, and who has demonstrated a superior performance and particular aptitude for research during the first three semesters of the MSc program. In exceptional cases, students with an 'A-' (or a minimum average of 80%) standing in a baccalaureate program and a demonstrated aptitude for research may be granted direct entry into the PhD program.

Degree Requirements

Course requirements are specified by the student's advisory committee and include the seminars. The qualifying examination should be completed no later than the end of the third semester for students entering after completing the MSc degree and the fifth semester for students entering directly after completing a baccalaureate degree. For students transferring from the MSc to the PhD degree, the examination will be completed before the end of the semester following that in which the transfer was approved.

The PhD research project is intended to give the student further, more intensive experience than that of an MSc program. In addition, the student must develop the ability to generate innovative research ideas and implement them through carefully designed experiments. The student is expected to develop and demonstrate a high degree of scholarship and expertise in the chosen specialty, and to exert critical judgement. The research must also yield results which, in the opinion of the examination committee, warrant publication in reputable scientific journals appropriate to the area of specialization.

Interdepartmental Programs

MSc (Aquaculture) Interdepartmental Program

The Department participates in the master of science in aquaculture program. Professor Stevenson is a member of the Aquaculture Interdepartmental Group. Her research and teaching expertise includes aspects of aquaculture; she may serve as advisor for MSc (Aquaculture) students. Please consult the Aquaculture listing for a detailed description of the MSc (Aquaculture) interdepartmental program.

Biophysics MSc/PhD Program

The Department participates in the MSc/PhD programs in biophysics. Professors Beveridge, Whitfield and Wood are members of the Biophysics Interdepartmental Group. These faculty members' research and teaching expertise includes aspects of biophysics; they may serve as advisors for MSc and PhD students in biophysics. Please consult the Biophysics listing for a detailed description of the graduate programs offered by the Biophysics Interdepartmental Group.

Courses

Physiology, Structure and Genetics

MICR*6040 Advanced Microbial Physiology W [0.50]

A study of molecular structure-function relationships fundamental to the survival and growth of bacteria. Topics for study will be selected from the literature on bacterial cytology, bioenergetics, metabolism, enzymology and adaptation.

MICR*6070 Bacterial Structures and Virulence F [0.50]

A study of the roles of bacterial surface structures (LPS, capsules, flagella, fimbriae, outer membrane proteins) in the virulence of bacteria. (Jointly offered by the Departments of Microbiology and Pathobiology.)

MICR*6500 Microbial Genetics W [0.50]

A study of recent research developments on the mechanisms of regulation of gene expression, DNA metabolism and genome analysis of microorganisms. (Offered in even-numbered years.)

Virology

MICR*6130 Molecular Biology of Viruses W [0.50]

Replication strategies of virus genomes including prototypes of different animal, plant and (some) bacterial virus families; mechanism and control of viral gene expression; tumour virology; genetically engineered virus vaccines

Restriction(s): Credit can NOT be obtained for both MICR*4130 and MICR*6130.

Pathogenesis

MICR*6500 Microbial Genetics W [0.50]

A study of recent research developments on the mechanisms of regulation of gene expression, DNA metabolism and genome analysis of microorganisms. (Offered in even-numbered years.)

MICR*6070 Bacterial Structures and Virulence F [0.50]

A study of the roles of bacterial surface structures (LPS, capsules, flagella, fimbriae, outer membrane proteins) in the virulence of bacteria. (Jointly offered by the Departments of Microbiology and Pathobiology.)

MICR*6423 Advances in Immunology and Immunochemical Techniques W [0.50]

Concepts and current knowledge of the diversity of immune response, experimental systems used in studying immunology, antigen-antibody reaction methods, monoclonal antibodies, antibody engineering, hypersensitivity reactions, autoimmunity, adhesion molecules and homing of cells of the immune system.

General

MICR*6950 Selected Topics in Microbiology U [0.50]

This course, offered on an irregular basis, provides opportunities for graduate students to study special topics of mutual interest under the guidance of graduate faculty members with pertinent expertise. Proposed course descriptions are considered by the Department of Microbiology on an ad hoc basis.

MICR*6540 Introductory Seminar F,W,S [0.25]

A literature review of a selected area of microbiological research concluding with a written research proposal, and a seminar on the information which is presented within the first two semesters of the program. The course is required for MSc students, but is optional for PhD students who have taken an equivalent course.

MICR*6590 Advanced Seminar F,W [0.25]

Public seminars on current microbiological or allied research topics. MSc students give one seminar while Ph.D. students give two seminars. The topics must be on subjects other than the student's area of research.

Molecular Biology and Genetics

The Molecular Biology and Genetics program offers MSc and PhD degrees. The four major areas of emphasis and the faculty associated with those areas are:

- **Molecular Biology** -- Bag, Baker, Bendall, Colasanti, Lu, Mosser, Nazar, Phillips, Rothstein, Wildeman, Yankulov
- **Genetics** -- Baker, Bendall, Colasanti, Phillips, Robb, Rothstein
- **Cell Biology** -- Bag, Bendall, Harauz, Lu, Mosser, Nazar, Robb, Wildeman
- **Biochemistry** -- Baker, Brauer, Coppolino, Dawson, Harauz, Josephy, Keates, Mangroo, Merrill, Mosser, Phillips, Sharom

Interdepartmental programs are available for students wishing to specialize in biophysics, plant genetics and toxicology.

Administrative Staff

Chair

Chris Whitfield (1252 Science Complex, Ext. 53361)
cwhitfie@uoguelph.ca

Graduate Co-ordinator

Richard Mosser (239 Axelrod, Ext. 58059)
rmosser@uoguelph.ca

Graduate Secretary

Carol Schlaht (1250 Science Complex, Ext. 53815)
cschlaht@uoguelph.ca

Graduate Faculty

Jnanankur Bag

BSc, MSc, PhD Calcutta - Professor

Mark D. Baker

BSc Laurentian, MSc, PhD Waterloo - Associate Professor

Andrew J. Bendall

BSc, MSc Australian National, PhD Macquarie - Assistant Professor

Joseph L. Colasanti

BSc, PhD Western Ontario - Assistant Professor

George Harauz

BASc, MSc, PhD Toronto - Professor

Ray Lu

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

Richard D. Mosser

BSc, PhD Waterloo - Associate Professor

Ross N. Nazar

BSc, PhD Toronto - Professor

John P. Phillips

BSc Emporia, MS, PhD Utah State - Professor

E. Jane Robb

BSc York, PhD British Columbia - Professor

Steven Rothstein

BA Swarthmore College, PhD Wisconsin - Professor

Alan G. Wildeman

BSc, MSc Saskatchewan, PhD Guelph - Professor

Krassimir (Joseph) Yankulov

BSc Sophia, PhD ICRF London - Assistant Professor

MSc Program

Admission Requirements

The minimum requirement for admission is a baccalaureate in an honours science 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 two undergraduate years.

Degree Requirements

In addition to a research thesis, three courses (1.5 credits) including the Research Topics Course, MBG*6080, are normally required for the MSc degree. Students must also take part in Seminars in Molecular Biology and Genetics, MBG*6000, and present a formal seminar on their thesis research at the end of their program.

PhD Program

Admission Requirements

Admission to doctoral programs normally requires at least high second-class honours as well as a recognized master of science degree. Direct admission of a BSc graduate to the PhD program will only be considered in the Department if the student has an average of 80% or greater in their last two undergraduate years.

Degree Requirements

In addition to a research thesis, the minimum course requirement following an MSc degree includes the completion of the Research Topics Course, MBG*6080, and Seminars in
Feb. 17, 2006

Molecular Biology and Genetics, MBG*6000. Students must present a formal seminar on their thesis research at the end of their program. For a PhD degree following a BSc degree, four courses (2.0 credits) including the research topics course and the seminar course are required.

Interdepartmental Programs

Biophysics MSc/PhD Program

The Department participates in the MSc/PhD programs in biophysics. Professor Frances Sharom is a member and Chair of the Biophysics Interdepartmental Group (BIG). Please consult the Biophysics listing for a detailed description of the graduate programs offered by the Biophysics Interdepartmental Group (BIG). Additional department members who participate in the BIG program are Manfred Brauer, George Harauz, Robert Keates, Dev Mangroo, and Rod Merrill.

Courses

Molecular Biology

MBG*6020 Topics in Molecular Biology and Biotechnology W [0.50]

The course will review recent publications in molecular genetics and developmental biology, and provide opportunity for discussion of how recombinant DNA technology is being used in basic research and in biotechnology. This course is offered yearly.

MBG*6050 Recombinant DNA Technology S [0.50]

A laboratory course including DNA and vector purification, preparation of genomic libraries and subcloning using plasmid vectors, PCR, and Southern blotting. Please contact the department for detailed information.

MCB*6110 Protein Structural Biology and Bioinformatics W [0.50]

This course will explore the relationship between protein sequences and structure. Students will gain hands-on experience with web-based resources and tools, particularly methods relating to protein structural prediction.

MCB*6210 Structure and Function of Biological Membranes F [0.50]

This course covers multidisciplinary investigations of the basic structure of membranes, and their role in eukaryotic and prokaryotic cell biology. Topics will include structural biology of membrane proteins, experimental approaches for studying membranes, membrane transport systems, import-export systems and membrane trafficking.

Cell Biology and Genetics

MBG*6060 Topics in Cell Biology and Genetics F [0.50]

The course will review recent publications in transmission genetics, chromosome structure and recombination, and provide opportunity for discussion of cell biology topics where advances in genetics are having an impact. This course is offered yearly.

MBG*6100 High Resolution Microscopy for Molecular Biologists W [0.50]

A laboratory course to acquaint students with high resolution light and electron microscopy technology common to molecular biologists and geneticists. The course includes hybridization and immunological probing techniques being applied to the cellular apparatus for gene expression as well as technology used with purified DNA and nucleoprotein complexes. This course is offered yearly.

General

MBG*6000 Seminars in Molecular Biology and Genetics F,W [0.00]

A forum for topical discussions in molecular biology and genetics. Students in the MSc and PhD programs in molecular biology and genetics are required to register in this course for four and six semesters, respectively.

MCB*6010 Advanced Topics in Biochemistry U [0.50]

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

MBG*6080 Research Topics Course F,W,S [0.50]

This course will require that students research and write a proposal for the work they plan to pursue for their thesis topic. It must be taken within the first two semesters of a graduate program, and will be under the supervision of the student's advisory committee. Students will present a seminar on this literature review and proposal as part of their participation in this course.

Pathobiology

The Department of Pathobiology offers programs in Veterinary Pathology, Comparative Pathology, Veterinary Infectious Diseases and Immunology.

There are four graduate degree programs. 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: Hunter, Smith; Fish pathology: Lumsden; Zoo animal/wildlife pathology: Barker, Hunter, Smith; Laboratory animal medicine: Turner

- **Immunology:** Mallard, Sharif, Shewen, Wilkie.

- **Veterinary Infectious Diseases**

Veterinary bacteriology: Boerlin, Gyles, MacInnes, Prescott; Veterinary parasitology: Barta, Peregrine; Veterinary Virology: Nagy, Yoo.

- **Veterinary Pathology**

Anatomic pathology: Barker, Caswell, Foster, Hayes, McCutcheon, Stalker; Clinical pathology: Bienzle, Jacobs, Wood.

The DVSc is offered in applied areas of microbiology, immunology or pathology. The diploma program is offered in applied areas of pathology.

Administrative Staff

Chair

John Prescott (2141 O.V.C., Ext. 54453)
jprescott@uoguelph.ca

Graduate Co-ordinator

Janet MacInnes (12058 O.V.C., Ext. 54731)
macinnes@uoguelph.ca

Graduate Secretary - Admissions

Donna Kangas (2144 O.V.C., Ext. 54725)
dkangas@ovc.uoguelph.ca

Graduate Faculty

Ian K. Barker

DVM, MSc Guelph, PhD Melbourne - Professor

John R. Barta

BSc, PhD Toronto - Professor

Dorothee Bienzle

DVM, MSc Guelph, PhD McMaster, Dipl ACVP - Assistant Professor

Patrick Boerlin

DVM, PhD Bern - Associate Professor

Jeff Caswell

DVM, DVSc Guelph, PhD Saskatchewan, Dipl ACVP - Assistant Professor

Robert A. Foster

BVSc Queensland, PhD James Cook Univ. of North Queensland, MRCVS, Dipl ACVP - Associate Professor

Jeffrey T. Gray

BS, MS Nebraska, PhD Iowa State - Associate Professor

Carlton L. Gyles

DVM Toronto, MSc, PhD Guelph - Professor

M. Anthony Hayes

BVSc Melbourne, PhD Saskatchewan, Dipl ACVP - Professor

D. Bruce Hunter

DVM, MSc Saskatchewan - Associate Professor

Robert M. Jacobs

BSc Toronto, DVM, PhD Guelph, Dipl ACVP - Professor

John S. Lumsden

BSc, DVM, MSc, PhD Guelph - Associate Professor

Janet I. MacInnes

BSc Victoria, PhD Western Ontario - Associate Professor

Bonnie A. Mallard

BSc, MSc, PhD Guelph - Professor

L. Jill McCutcheon

BSc, DVM Guelph, PhD Washington State - Professor

Éva Nagy

DVM, PhD, DSc Budapest - Associate Professor

Andrew S. Peregrine

BVMS(Hons.), PhD, DVM Glasgow - Associate Professor

John F. Prescott

MA, VetMB, PhD Cambridge - Professor and Chair

Shayan Sharif

2004-2006 University of Guelph Graduate Calendar

DVM Tehran, PhD Guelph - Assistant Professor

Patricia E. Shewen

BSc, DVM, MSc, PhD Guelph - Professor

Dale A. Smith

DVM, DVSc Guelph - Professor

Margaret J. Stalker

BSc Queen's, DVM Saskatchewan, PhD Guelph, Dipl ACVP - Assistant Professor

Patricia V. Turner

BSc McMaster, MSc Dalhousie, DVM, DVSc Guelph, Dipl ACLAM - Associate Professor

Bruce N. Wilkie

DVM Guelph, PhD Cornell - Professor

R. Darren Wood

DVM Prince Edward Island, DVSc Guelph - Assistant Professor

Dongwan Yoo

DVM, MSc Seoul, PhD Ottawa - Associate 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 to diseases of vertebrates. DVM (or equivalent) graduates may obtain some of the practical experience required for specialty certification in veterinary anatomic pathology, clinical pathology, microbiology or parasitology.

Admission Requirements

Applicants should have either a DVM (or equivalent) degree with at least a 'B' average over the four years of the program, or an honours degree in biological sciences with at least a 'B' average during the final 2 years. 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 the prior identification of a faculty advisor and a source of financial support for the student. Supportive letters of reference, based on sound knowledge of the applicant, are essential. Applicants should submit a one-page statement of research interests and career goals in order to assist in the identification of a faculty advisor who has the facilities and funding necessary to support the thesis research, and who can provide a stipend if the student is not independently supported. Applications may be submitted at any time. Students may be admitted 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, research and career objectives. The departmental Graduate Seminar course 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 of the Faculty of Graduate Studies.

PhD Program

The PhD program is designed primarily for students whose career aspirations are towards the independent research on the manifestations, basic mechanisms and host resistance to diseases of vertebrates. The primary objective is to provide advanced training in conceptual and laboratory aspects of independent research, combined with advanced training in one or more appropriate 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, 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 strong supportive letters from referees familiar with the background of the applicant. Performance in relevant biomedical science courses, (e.g. microbiology, immunology, biochemistry, molecular biology, etc) at a level above the 'B+' average is normally expected. Students may apply for admission into the PhD program before completing the MSc program, providing that they have a minimum A average and a demonstrated capacity for independent research. Some students with demonstrated potential for independent research and a superior academic record during their baccalaureate or DVM programs may be admitted directly into the PhD program.

Admission requires the identification of a faculty advisor and a source of financial support for the student. If these have not been arranged by the applicant, a statement of the applicant's interests and objectives and supportive letters of reference are required to assist with the identification of an appropriate faculty advisor and potential sources of funds for

research and provision of a stipend for the student. Applications may be submitted at any time. Initial enrolment can be in the fall, winter or summer semesters, with a preference for the fall.

Degree Requirements

Students must have completed the department's graduate seminar course, 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, and 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 only 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 in-depth understanding of one or two additional areas. 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 on the research project, and on the writing of a research proposal on a subject proposed by the student and approved by the advisory committee. PhD students in semesters six to nine are required to make a 25 minute presentation as part of the Departmental Seminar Series.

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 program is completed with the satisfactory presentation and defence of a thesis, which includes a seminar presentation and a final oral examination by a committee that includes an external examiner and several members of the graduate faculty.

See also the PhD Degree Regulations of the Faculty of Graduate Studies.

DVSc Program

The Department of Pathobiology participates in the DVSc program which provides a balance of advanced training in a discipline in veterinary medicine, combined with a thesis-research project. The program emphasizes diagnostic and health management aspects of veterinary anatomic pathology, veterinary clinical pathology, veterinary clinical microbiology, clinical immunology, laboratory animal science, wildlife and zoo animal pathology, avian medicine and pathology, and fish pathology. The research project addresses an applied aspect of a significant disease problem in vertebrates. The program provides practical training towards specialty certification in veterinary anatomic pathology, clinical pathology, veterinary clinical microbiology or veterinary parasitology. Refer to the Veterinary Science section of the calendar for more information.

Admission Requirements

Applicants require a DVM (or equivalent) degree with high academic standing from a program that provides eligibility for the practice of veterinary medicine in Ontario. Alternatively, applicants with a DVM (or equivalent) degree can be admitted after completion of an acceptable graduate diploma, MSc, or PhD degree with an upper 'B' average. Admission requires the identification of a faculty advisor and a source of personal support for the student. If these have not been arranged by the applicant, a statement of the applicant's interests and objectives and supportive letters of reference are required to assist with the identification of an appropriate faculty advisor and potential sources of funds for research and student stipend. Several stipends for DVSc candidates are available intermittently for training in some disciplines serving the Veterinary Teaching Hospital. As these funds become available, stipends are awarded to the most qualified applicant(s) based on completed applications for admission to the DVSc program. Applications may be submitted at any time. Initial enrolment can be in the fall, winter or summer semesters.

Degree Requirements

The degree requires a minimum of nine semesters of full-time study; completion of department's graduate seminar course, the completion of at least 2.5 credits in other courses prescribed by the student's advisory committee with an overall average of at least 'B-', and satisfactory completion of a qualifying examination, thesis and final oral examination. See also the DVSc Degree Regulations of the Faculty of Graduate Studies.

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.

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 diploma requires three semesters of full-time study, and satisfactory completion of at least 1.5 credits in applied pathology courses and 0.5 credits in other graduate courses, including the graduate seminar 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 general knowledge in the 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*6400 Seminar F,W,S [0.00]

A thesis research plan to be presented orally to the department by the third week of the third semester.

PABI*6960 Special Topics in Pathobiology F,W,S [0.00]

In-depth independent study of subjects related to students' principal area of interest. Major paper(s), laboratory studies, and/or written and oral examination, with or without seminar preparation.

Comparative Pathology

PABI*6050 Applied Avian Pathology I F [0.50]

Examination and interpretation of gross and microscopic lesions of domestic birds.

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 and early spring conditions.

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 late spring and summer conditions.

PABI*6221 Comparative Veterinary Pathology I W [0.50]

Pathological changes associated with diseases of fish, amphibia, reptiles, wild and captive non-domestic birds, marine and wild mammals including fur-bearers. (even numbered years)

PABI*6222 Comparative Veterinary Pathology II F [0.50]

Pathological changes associated with diseases of poultry and pet birds, and various laboratory animals. (even numbered years)

PABI*6630 Applied Comparative Pathology I F [0.50]

A study of problems in, as well as the examination of, lesions found in diseases of fish and wildlife, including amphibia and reptiles, drawn from naturally occurring cases assigned for detailed investigation. The student may be required to prepare a critical review of a specific disease entity.

PABI*6640 Applied Comparative Pathology II W [0.50]

A continuation of PABI*6630 emphasizing seasonal differences in diseases as well as diseases more commonly associated with winter and early spring conditions.

PABI*6650 Applied Comparative Pathology III F [0.50]

A continuation of PABI*6640 emphasizing seasonal difference in diseases as well as diseases more commonly associated with late spring and summer conditions.

PABI*6700 Laboratory Animal Science U [0.50]

Basic information on various aspects of laboratory animal science, including IACUC function, regulatory oversight, ethics, historical review of animal research, animal models and alternatives, experimental design and considerations, biology, management and uses of common species in research.

PABI*6710 Applied Laboratory Animal Science I U [0.50]

Continuation of I with emphasis on biohazard and personnel safety, monitoring for disease, quality control and diagnostic procedures.

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.

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.

PABI*6740 Avian Diseases W [0.50]

Detailed study of recent concepts of preventive medicine, diagnosis and therapeutics as applied to clinical recognition and control of avian diseases.

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]**

Pathogenic bacteria with particular reference to pathogenesis, immunology, epidemiology and control.

PABI*6180 Clinical Bacteriology W [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.

PABI*6350 Molecular Epidemiology of Bacterial Diseases U [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*6420 Diagnostic Parasitology F [0.50]

Study of the laboratory diagnosis of parasites of domestic animals. (even numbered years)

MICR*6070 Bacterial Structures and Virulence F [0.50]

A study of the roles of bacterial surface structures (LPS, capsules, flagella, fimbriae, outer membrane proteins) in the virulence of bacteria. (Jointly offered by the Departments of Microbiology and Pathobiology.)

MICR*6130 Molecular Biology of Viruses W [0.50]

Replication strategies of virus genomes including prototypes of different animal, plant and (some) bacterial virus families; mechanism and control of viral gene expression; tumour virology; genetically engineered virus vaccines

Restriction(s): Credit can NOT be obtained for both MICR*4130 and MICR*6130.

MICR*6500 Microbial Genetics W [0.50]

A study of recent research developments on the mechanisms of regulation of gene expression, DNA metabolism and genome analysis of microorganisms. (Offered in even-numbered years.)

Veterinary Pathology**PABI*6030 Applied Clinical Pathology I F,W,S [0.50]**

Preparation and description of materials, and interpretation of data involved in hematology, cytology, and clinical chemistry from clinical cases. (Intended for students majoring in clinical pathology.)

PABI*6040 Applied Clinical Pathology II U [0.50]

A continuation of PABI*6030 with greater depth in the interpretation of data involved in hematology, cytology and clinical chemistry from clinical cases (Intended for students majoring in clinical pathology).

PABI*6041 Applied Clinical Pathology III U [0.50]

A continuation of PABI*6040 with greater depth in the interpretation of data involved in hematology, cytology and clinical chemistry from clinical cases (Intended for students majoring in clinical pathology).

PABI*6080 Diagnostic Pathology I - Domestic Mammals F [0.50]

Examination and interpretation of gross and microscopic lesions of animal diseases.

PABI*6090 Diagnostic Pathology II - Domestic Mammals W [0.50]

A continuation of PABI*6080, emphasizing seasonal differences in diseases as well as diseases more commonly associated with winter and early spring conditions.

PABI*6091 Diagnostic Pathology III - Domestic Mammals S [0.50]

A continuation of PABI*6090, emphasizing seasonal differences in diseases as well as diseases more commonly associated with late spring and summer conditions.

PABI*6104 Mechanisms of Disease F [0.50]

Molecular, cellular and tissue processes involved in the pathogenesis of adaptive, degenerative, inflammatory, proliferative and neoplastic diseases. (odd numbered years)

PABI*6105 Integrative Pathology F [0.50]

Basic and interpretive tissue and biochemical concepts of disease in the liver, pancreas, kidney, endocrine and hemicymphatic systems. (even numbered years)

PABI*6110 Pathology I W [0.50]

Disease processes of the respiratory, integumentary, reproductive and skeletal systems. (Disease processes of the respiratory, integumentary, reproductive and skeletal systems.)

PABI*6130 Pathology II W [0.50]

Disease processes of the alimentary, central-nervous, cardiovascular and muscular systems and special senses. (odd numbered years)

PABI*6300 Clinical Pathology I W [0.50]

A study of diagnostic hematology and cytology, with emphasis on the hematopoietic system. (even numbered years)

PABI*6320 Clinical Pathology II W [0.50]

Clinical biochemistry of selected organ systems including the renal, hepatic, pancreatic and endocrine organ systems. (odd numbered years)

Philosophy

Administrative Staff

Chair

Andrew Wayne (347 MacKinnon, Ext. 56389)
awayne@uoguelph.ca

Graduate Co-ordinator

Mark McCullagh (356 MacKinnon, Ext. 53221)
mmcculla@uoguelph.ca

Graduate Faculty

Andrew Bailey

BA, MA Oxford, PhD Calgary - Assistant Professor

David Castle

BSc, BA Alberta, MA McMaster, PhD Guelph - Associate Professor

Donald Dedrick

BA, MA Carleton, PhD Toronto - Assistant Professor

Peter Eardley

BA McGill, MA, PhD Toronto - Assistant Professor

Karyn L. Freedman

BA, MA Manitoba, PhD Toronto - Assistant Professor

Jean Harvey

BA Wales, MA Simon Fraser, PhD British Columbia - Associate Professor

Karen L. Houle

BSc, MA, PhD Guelph - Assistant Professor

Jay Lampert

BA, MA, PhD Toronto - Associate Professor

Peter Loptson

BA York, MA, PhD Pittsburgh - Professor

Mark McCullagh

BA Toronto, PhD Pittsburgh - Assistant Professor and Graduate Coordinator

Jeffrey A. Mitscherling

BA California (Santa Barbara), MA McMaster, PhD Guelph - Professor

Jay A. Newman

BA Brooklyn, MA Brown, PhD York, FRSC - Professor

Omid Payrow Shabani

BA, MA Carleton, PhD Ottawa - Assistant Professor

John Russon

BA Regina, MA, PhD Toronto - Associate Professor

Patricia Sheridan

BA McGill, MA Concordia, PhD Western - Assistant Professor

Andrew Wayne

BSc Toronto, MA, PhD California - Associate Professor and Chair

Karen Wendling

BA Michigan State, MA, PhD Toronto - Associate Professor

Graduate Faculty from McMaster and Wilfrid Laurier Universities

In addition to the aforementioned members of the Guelph graduate faculty who support the Guelph MA program, the Guelph-McMaster-Laurier joint PhD program includes the following faculty members from McMaster and Wilfrid Laurier Universities.

Barry G. Allen

BA Lethbridge, MA, PhD Princeton - Professor, McMaster

Richard T. W. Arthur

PhD Western Ontario - Professor and Chair of Philosophy Dept., McMaster

Neil Campbell

BA Toronto, PhD McMaster - Associate Professor, Wilfrid Laurier

Renato Cristi

PhD Toronto - Professor, Wilfrid Laurier

Diane Enns

PhD SUNY (Binghamton) - Assistant Professor, McMaster

Brian Garrett

PhD McGill - Assistant Professor, McMaster

Elisabeth (Boetzkes) Gedge

PhD Calgary - Associate Professor, McMaster

Nicholas Griffin

BA Leicester, PhD Australian National - Professor, McMaster

Leo Groarke

PhD Western Ontario - Professor, Wilfrid Laurier

Stephen Haller

PhD Guelph - Assistant Professor, Wilfrid Laurier

David L. Hitchcock

BA McMaster, PhD Claremont - Professor, McMaster

Violetta Ighneski

PhD Toronto - Assistant Professor, McMaster

Rockney Jacobsen

PhD Alberta - Associate Professor, Wilfrid Laurier

Howard Jones

PhD Indiana - Professor (Classics), McMaster

Jill Leblanc

BA McMaster, MA, PhD Toronto - Associate Professor, McMaster

Robert Litke

PhD Michigan - Professor, Wilfrid Laurier

Spiro Panagiotou

BSc, MA Guelph, PhD St. Andrews - Associate Professor, McMaster

Jill Rusin

PhD John Hopkins - Assistant Professor, McMaster

Brigitte Sassen

BA Toronto, MA, PhD Pennsylvania State - Associate Professor, McMaster

Mark Vorobej

BA Carleton, MA, PhD Toronto - Associate Professor, McMaster

Wil Waluchow

MA Western Ontario, DPhil Oxford - Professor, McMaster

Allison Weir

PhD York - Associate Professor, Wilfrid Laurier

Byron Williston

PhD Toronto - Associate Professor, Wilfrid Laurier

James Wong

PhD Toronto - Assistant Professor, Wilfrid Laurier

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

An honours baccalaureate, normally in philosophy, from a recognized university. Serious consideration will also be given to students with an honours baccalaureate in some other discipline. 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 the Philosophy Department website.

Degree Requirements

All students must take the MA Research Seminar 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. Candidates by research project must take at least eight semester-long courses. 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.

PhD Program

The University of Guelph, jointly with McMaster University and Wilfrid Laurier University, 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 Tri-University Doctoral Program in Philosophy, which consists of members drawn from all three university departments, is a semi-autonomous body responsible directly to the three graduate schools. It is responsible for admissions, for the program of instruction and for the naming of a student's advisory committee. Students in the program may enroll either at Guelph, McMaster or Wilfrid Laurier. A student comes under the general regulations of the university in which he or she is registered and the degree is granted by that university.

The program offers supervision in most of the traditional areas of philosophy but the special strengths of the program are in continental philosophy; epistemology and metaphysics; history of western philosophy; philosophy of science; language and logic; social, political and legal philosophy; and theoretical and applied ethics.

Admission Requirements

An applicant for admission is required to have an MA in philosophy from a recognized university.

Degree Requirements

Students normally will be required to take six courses in philosophy including the doctoral research seminar (PHIL*6960). In special circumstances students may take as few as four courses in philosophy. 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. A student who has not passed an oral qualifying examination by the end of their fifth semester will not be allowed to continue 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 90,000 words (300 pages).

Courses

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

Guelph

Historical

PHIL*6310 Plato U [0.50]

A study of some of the major works of Plato.

PHIL*6311 Aristotle U [0.50]

A study of some of the major works of Aristotle.

PHIL*6320 Medieval Philosophy U [0.50]

A close examination of particular problems and texts of the medieval period

PHIL*6340 Modern Philosophy U [0.50]

An examination of major texts, from Descartes to Mill.

PHIL*6500 John Locke U [0.50]

A critical examination of the works of John Locke.

PHIL*6530 Kant U [0.50]

A critical examination of the works of Immanuel Kant.

PHIL*6700 Survey of Ancient Philosophy U [0.50]

A survey of modern philosophy from Hobbes to Hume for students in the philosophy MA program without a BA in philosophy.

PHIL*6710 Survey of Early Modern Philosophy U [0.50]

A survey of modern philosophy from Hobbes to Hume for students in the philosophy MA program without a BA in philosophy.

PHIL*6810 Survey of Late Modern Philosophy U [0.50]

A survey of modern philosophy from Kant to the late 19th century for students in the MA program without a BA in philosophy.

Ethics/Value Theory

PHIL*6000 Value Theory U [0.50]

A critical examination of some selected contemporary works in value theory or aesthetics.

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 of problems in biomedical ethics.

PHIL*6600 Social and Political Philosophy U [0.50]

A critical examination of some selected contemporary works or central problems in the field of social philosophy.

PHIL*6760 Science and Ethics U [0.50]

A consideration of the problems which arise in the conjunction of science and ethics.

Metaphysics/Epistemology

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 Continental Theory 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 Continental Theory 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.

Philosophy of Science

PHIL*6720 History of the Philosophy of Science U [0.50]

A survey of the history of the philosophy of science from the Presocratics to the Positivists.

PHIL*6730 Contemporary Philosophy of Science U [0.50]

An examination of the contemporary discipline of the philosophy of science.

PHIL*6740 Philosophy of Biology U [0.50]

A general introduction to the history and philosophy of biology.

PHIL*6750 Philosophy of Social Science U [0.50]

A critical examination of issues in the philosophy of social science

General

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*6770 Special Research Paper I U [0.50]

A research course in a topic of the student's choice, guided by an individual faculty member.

PHIL*6780 Special Research Paper II U [0.50]

A research course in a topic of the student's choice, guided by an individual faculty member.

PHIL*6900 Reading Course U [0.50]

PHIL*6930 Selected Topics I U [0.50]

Topics in this course will vary from offering to offering.

PHIL*6940 Selected Topics II U [0.50]

Topics in this course will vary from offering to offering.

PHIL*6950 MA Seminar U [0.50]

A seminar course in which students work on developing research papers in topics of their own choice. This course must be taken by all MA students. Students must register for this course in both fall and winter semesters.

PHIL*6960 PhD Graduate Seminar U [0.50]

A seminar course in which students work on developing research papers in topics of their own choice. Students must register for this course in both fall and winter semesters. PhD students must do at least one and may do two graduate seminar courses during their programs.

PHIL*6990 Guided Research Project U [1.00]

A guided research project undertaken by students doing an MA by course work, under the supervision of a faculty member.

McMaster University

Topics courses differ in content from year to year and, under different descriptions, may be taken a second time for credit. Candidates should consult the chair for the specific offerings in a given year.

MCM*6B03 Theory of Value MCM*6D03 Twentieth Century Analytic Philosophy MCM*706 Basic Symbolic Logic MCM*719 Reading Course MCM*720 Reading Course MCM*731 Special Studies in Philosophy MCM*743 Graduate Seminar I MCM*744 Graduate Seminar II MCM*750 Selected Topics in Ancient Philosophy MCM*751 Selected Topics in Medieval Philosophy MCM*752 Selected Topics in Modern British Philosophy (1600-1900) MCM*753 Selected Topics in Early Modern European Philosophy (1600-1800) MCM*754 Selected Topics in Kant MCM*755 Selected Topics in Nineteenth Century European Philosophy MCM*756 Selected Topics in Twentieth Century European Philosophy MCM*757 Selected Topics in Twentieth Century British Philosophy MCM*758 Selected Topics in American Philosophy MCM*759 Selected Topics in Applied Ethics MCM*760 Selected Topics in Logic & the Theory of Argumentation MCM*761 Selected Topics in Philosophy of Language MCM*762 Selected Topics in Metaphysics MCM*763 Selected Topics in Epistemology & Philosophy MCM*764 Selected Topics

in Social & Political Philosophy MCM*765 Selected Topics in Ethical Theory MCM*766
Selected Topics in Philosophy of Religion MCM*767 Selected Topics in Aesthetics
MCM*768 Selected Topics in Existential Phenomenology & Hermeneutics MCM*769
Selected Topics in Philosophy of Law MCM*770 Selected Topics in Philosophy of
Education MCM*771 Selected Topics in Philosophy of Science

Wilfrid Laurier University

WLU*780 Selected Topics in Social, Political & Legal Philosophy WLU*781 Selected
Topics in the History of Philosophy WLU*782 Selected Topics in Continental Philosophy
WLU*783 Selected Topics in Ethics WLU*784 Selected Topics in the Philosophy of
Mind and Language WLU*785 Selected Topics in Formal and Philosophical Logic
WLU*786 Selected Topics in the Theory of Argumentation WLU*787 Selected Topics
in Metaphysics and Epistemology WLU*7880 Research Seminar WLU*7890 Directed
Study. Each year philosophy professors at Laurier offer courses in the Humanities/Religion
and Culture M.A. program at WLU. Past topics have included Nietzsche, Feminist Theory,
Virtues and Vices, and Trust and Authority. Philosophy PhD students can arrange to take
these courses for Philosophy credit. Consult the Laurier Philosophy Department for each
year's offerings.

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 send applications for admission to the director of the Institute. 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

Jamie Forrest (Waterloo, Ext. (519) 888-4567, Ext. 7598)
gwp@sciborg.uwaterloo.ca

Administrative Assistant for the Program

Margaret O'Neill (Waterloo, Ext. (519) 888-4567, Ext. 7598)
gwp@sciborg.uwaterloo.ca

Departmental Chair

James Davis (211 MacNaughton, Ext. 52659/58541)
jhd@physics.uoguelph.ca

Departmental Graduate Co-ordinator

Eric Poisson (448 MacNaughton, Ext. 53949)
poisson@physics.uoguelph.ca

Departmental Graduate Secretary

Reggi Vallillee (209 MacNaughton, Ext. 52262)
rv@physics.uoguelph.ca

Graduate Faculty

Robert L. Brooks

BS Villanova, MSc, PhD Alberta - Professor

Leonid S. Brown

MSc, PhD Moscow State - Assistant Professor

J.L. 'Iain' Campbell

BSc, PhD, DSc Glasgow - Professor

James H. Davis

BS, BA Moorehead State College, PhD Manitoba - Professor and Chair

Diane G. de Kerckhove

BSc McGill, PhD Oxford - Assistant Professor

John R. Dutcher

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

Paul E. Garrett

BSc Queen's, MSc, PhD McMaster - Associate Professor

Saul Goldman

BSc, PhD McGill - Professor

Bryan R. Henry

BSc British Columbia, PhD Florida State - Professor

Kenneth R. Jeffrey

BSc, MSc, PhD Toronto - Professor

De-Tong Jiang

BSc Jilin, PhD Simon Fraser - Assistant Professor

Stefan W. Kycia

BSc McGill; MS Pennsylvania; PhD Iowa - Assistant Professor

Vladimir Ladizhansky

BS Moscow Institute of Physics and Technology; MS, PhD Weizmann Institute of Science (Rehovot, Israel) - Assistant Professor

Jimmy Law

BSc, PhD London - Professor

Anna T. Lawniczak

MSc Wroclaw, PhD Southern Illinois - Professor

Jacek Lipkowski

MSc, PhD, DSc Warsaw - Professor

Alejandro Marangoni

BSc McGill, PhD Guelph - Professor

Bernard G. Nickel

BE, MSc Saskatchewan, PhD California, FRSC - Professor

Elisabeth J. Nicol

BSc Mount Allison, MSc, PhD McMaster - Professor

Joanne M. O'Meara

BSc, PhD McMaster - Assistant Professor

Eric Poisson

BSc Laval, MSc, PhD Alberta - Professor

Xiao-Rong Qin

BSc, MSc Tsinghua (Beijing), PhD Simon Fraser - Assistant Professor

Donald E. Sullivan

BSc McGill, PhD M.I.T. - Professor and Director of the Institute

Carl E. Svensson

BSc, PhD McMaster - Associate Professor

Daniel F. Thomas

BSc Alberta, PhD Toronto - Associate Professor

Graduate Faculty from the University of Waterloo

Michael Balogh

BSc McMaster, PhD Victoria - Assistant Professor

Peter F. Bernath

BSc Waterloo, PhD M.I.T. - Professor

Kostadinka Bizheva

BS, MS Plovdiv, MS, PhD Tufts - Assistant Professor

James A. Blackburn

BSc Manitoba, MSc, PhD Waterloo - Professor (Cross or joint appointment with the Department of Physics, Wilfrid Laurier University)

William R. Bobier

BSc Queen's, MSc Waterloo, PhD Cambridge - Professor

Melanie C. Campbell

BSc Toronto, MSc Waterloo, PhD Australian National, FAAO - Professor

Z.Y. 'Jeff' Chen

BSc Fuden, PhD Maryland - Associate Professor

Marita C. Chidichimo

Licentiate Buenos Aires, PhD Cambridge - Associate Professor

Sydney G. Davison

BSc, MSc, PhD, DSc Manchester, FInstP - Professor

Thomas P. Devereaux

BSc New York, MSc, PhD Oregon - Associate Professor

Walter W. Duley

BEng McGill, DIC, PhD Imperial College, DSc London - Professor

Michael Fich

BSc Waterloo, MSc, PhD California - Associate Professor

James Forrest

BSc Simon Fraser, MSc, PhD Guelph - Associate Professor

Michel Gingras

BSc, MSc Laval, PhD British Columbia - Professor

M. Faridh Golnaraghi

BASc, MASc Worcester Polytechnic Institute, PhD Cornell - Professor

Frank O. Goodman

BSc, PhD, DSc London, FInstP, FAIP - Professor

Bae-Yeun Ha

BSc, MS Korea, PhD Maryland - Assistant Professor

Gretchen L. Harris

BA Mount Holyoke College, MA Wesleyan, PhD Toronto - Associate Professor

John W. Hepburn

BSc Waterloo, PhD Toronto - Professor

Robert Hill

BSc, PhD Bristol - Assistant Professor

Michael Hudson

BSc Montreal, PhD Cambridge - Assistant Professor

S.H.J. Idziak

BSc McGill, PhD Pennsylvania - Associate Professor

Lyndon Jones

BSc Cardiff, PhD Birmingham - Associate Professor

Achim Kempf

BSc Heidelberg, PhD Munich - Associate Professor

Jan Kycia

BSc McGill, MSc Pennsylvania, PhD Northwestern - Assistant Professor

Raymond Laflamme

BSc Laval, PhD Cambridge - Professor

James R. Lepock

BS, MS West Virginia, PhD Pennsylvania State - Professor and Chair

Robert LeRoy

BSc, MSc, PhD Toronto - Professor

Tong K. Leung

BSc, PhD British Columbia - Associate Professor

Stanley P. Lipshitz

BSc Natal, MSc South Africa, PhD Witwatersrand - Professor

John Lit

BSc, DipEd Hong Kong, DSc Laval - Professor (Cross or joint appointment with the Department of Physics, Wilfrid Laurier University)

Wing-Ki Liu

BSc, MSc, PhD Illinois - Professor

Qing-Bin Lu

BSc, MSc Fuzhou, China, PhD Newcastle - Assistant Professor

Robert B. Mann

BSc McMaster, MSc, PhD Toronto - Professor and Chair

Fotini Markopoulou

BSc Queen Mary and Westfield College, PhD Imperial College - Assistant Professor

James Martin

BSc, MSc, PhD Waterloo - Assistant Professor

F.R.W. McCourt

BSc, PhD British Columbia, PhD Alberta - Professor

Robert G. McLenaghan

MSc Queen's, PhD Cambridge - Professor

Michele Mosca

BMath Waterloo, MSc, DPhil Oxford - Professor

Robert C. Myers

PhD Princeton - Professor

Linda F. Nazar

BSc British Columbia, PhD Toronto - Professor

Hartwig Peemoeller

BSc Winnipeg, MSc Victoria, PhD Waterloo - Professor

Joseph Sanderson

BSc, PhD London - Assistant Professor

Gunter A. Scholz

BSc Simon Fraser, MSc McMaster, PhD Simon Fraser - Associate Professor

James J. Sloan

BSc, PhD Queen's - Professor

Lee Smolin

BA Hampshire AM, PhD Harvard - Professor

Donna Strickland

BEng McMaster, PhD Rochester - Associate Professor

Russell Thompson

BSc Ottawa, MSc Regina, PhD Western Ontario - Assistant Professor

Bruce H. Torrie

BASc Toronto, PhD McMaster - Professor

John Vanderkooy

BEng, PhD McMaster - Professor

Marek Wartak

MSc, PhD Technical University of Wroclaw - Associate Professor (Cross or joint appointment with the Department of Physics, Wilfrid Laurier University)

Paul S. Wesson

BSc London, PhD Cambridge, FRAS London - Professor

David Yevick

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 on forms obtained from the director of the Guelph-Waterloo Physics Institute, available from the web-site <http://gwp.on.ca/>

The admission requirements are as follows:

- An honours BSc degree in physics (or equivalent) with at least a B standing (75%) from a recognized university.
- Three letters of reference, two of which normally are from academic sources.

- Proof of competency in English (for applicants whose prior education was in a language other than English). See the University regulations on English Language Proficiency Certification.

- GRE Physics Subject Test score for all applicants who have completed their post-secondary education outside of Canada.

Successful applicants are encouraged to start their graduate studies in May or September, but a January starting date is possible. Academic transcripts and other supporting documents should be forwarded as soon as they become available. Admission to the program cannot be granted until all requirements have been met and all documents submitted.

Applications are considered by the Admissions Committee. It should be noted that students will normally be admitted only if an advisor can be found to oversee their research. Since there are a limited number of openings each year, applicants are advised to state alternative areas of research on the preference form supplied (see web-site <http://gwp.on.ca/>).

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 co-ordinator. If it is a physics course, it must be at the fourth-year level.

For all students (except those in biophysics**) the four courses must include at least one of Quantum Mechanics 1 (PHYS*7010), Statistical Physics 1 (PHYS*7040) and Electromagnetic Theory (PHYS*7060). A MSc student in this program who shows a particular aptitude for research and has a superior record in fourth-year undergraduate and three one-term graduate courses may be permitted, upon recommendation of the advisor and with the approval of the co-ordinating committee, to transfer into the PhD program without completing an MSc thesis.

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*7040 and PHYS*7060) 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 co-ordinator.

Course-Based MSc Option

Eight one-term courses 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. These courses must include the core courses Quantum Mechanics 1 (PHYS*7010), Statistical Physics 1 (PHYS*7040), and Electromagnetic Theory (PHYS*7060). [Exception: biophysics students taking the course-based MSc option are required to take only one of the core courses PHYS*7010, PHYS*7040 and PHYS*7060.] 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.

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. By the end of the first year of the program, all three of Quantum Mechanics I (PHYS*7010), Statistical Physics I (PHYS*7040) and Electromagnetic Theory (PHYS*7060) 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 co-ordinator. No undergraduate course in physics may be taken for credit.

After two or three terms in the program, PhD candidates are required to pass a qualifying examination. 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 related to the thesis topic. 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 PHYS*7010, PHYS*7040 and PHYS*7060 by the end of their first two academic terms in the program. (Exception: Biophysics students must 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. Professors Brown, Davis, Dutcher, Gray, Jeffrey, Kycia and Ladizhansky are members of the Biophysics Interdepartmental Group (BIG). These faculty members' research and teaching expertise includes aspects of biophysics; they may serve as advisors for MSc and PhD students 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.

Basic Group

PHYS*7010 Quantum Mechanics I * U [0.50]

Review of formalism of nonrelativistic quantum mechanics including symmetries and invariance. Approximation methods and scattering theory. Elementary quantum theory of radiation. Introduction to one-particle relativistic wave equations.

PHYS*7020 Quantum Mechanics II U [0.50]

Concepts of relativistic quantum mechanics, elementary quantum field theory, and Feynman diagrams. Application to many-particle systems.

Prerequisite(s): 7010 or equivalent

PHYS*7040 Statistical Physics I* U [0.50]

Statistical basis of thermodynamics; microcanonical, canonical and grand canonical ensembles; quantum statistical mechanics, theory of the density matrix; fluctuations, noise, irreversible thermodynamics; transport theory; application to gases, liquids, solids.

PHYS*7050 Statistical Physics II U [0.50]

Phase transitions. Fluctuation phenomena. Kubo's theory of time correlation functions for transport and spectral properties; applications selected from a variety of topics including linearized hydrodynamics of normal and superfluids, molecular liquids, liquid crystals, surface phenomena, theory of the dielectric constant, etc.

Prerequisite(s): PHYS*7040 or equivalent.

PHYS*7060 Electromagnetic Theory * U [0.50]

Solutions to Maxwell's equations; radiation theory, normal modes; multipole expansion; Kirchhoff's diffraction theory; radiating point charge; optical theorem. Special relativity; transformation laws for the electromagnetic field; line broadening. Dispersion; Kramers-Kronig relations. Magnetohydrodynamics and plasmas.

PHYS*7080 Applications of Group Theory U [0.50]

Introduction to group theory; symmetry, the group concept, representation theory, character theory. Applications to molecular vibrations, the solid state, quantum mechanics and crystal field theory.

PHYS*7110 Scattering Theory U [0.50]

Review of potential theory of scattering. Applications chosen from elastic- and inelastic-neutron X-ray, light, charged-particle, and atomic and molecular beam scattering.

Subatomic and Nuclear

PHYS*7030 Quantum Field Theory U [0.50]

Review of relativistic quantum mechanics and classical field theory. Quantization of free quantum fields (the particle interpretation of field quanta). Canonical quantization of interacting fields (Feynman rules). Application of the formalism of interacting quantum fields to lowest-order quantum electrodynamic processes. Radiative corrections and renormalization.

Prerequisite(s): PHYS*7010 or equivalent.

PHYS*7090 Green's Function Method U [0.50]

Review of essential quantum field theory. Zero and finite temperature. Green's functions. Applications.

PHYS*7150 Nuclear Physics U [0.50]

Static properties of nuclei; alpha, beta, gamma decay; two-body systems; nuclear forces; nuclear reactions; single-particle models for spherical and deformed nuclei; shell, collective, interacting boson models.

PHYS*7170 Intermediate and High Energy Physics U [0.50]

Strong, electromagnetic and weak interactions. Isospin, strangeness, conservation laws and symmetry principles. Leptons, hadrons, quarks and their classification, formation, interactions and decay.

PHYS*7670 Introduction to Quantum Information Processing F [0.50]

Quantum superposition, interference, and entanglement. Postulates of Quantum Mechanics. Quantum computational complexity. Quantum Algorithms. Quantum communication and cryptography. Quantum error correction. Implementations.

Astronomy and Astrophysics

PHYS*7800 Galactic Structure U [0.50]

Introduction to statistical theory and distribution laws. Statistical theory of the galactic system. Stellar motions in the solar vicinity. Galactic rotation. Space distribution of stars and their relation to the galaxy. Distribution of various galactic objects. Application to extra-galactic systems.

PHYS*7810 Astrophysics U [0.50]

The fundamental astronomical data: techniques to obtain it and the shortcomings present. The classification systems. Wide- and narrow-band photometric systems. The intrinsic properties of stars: colours, luminosities, masses, radii, temperatures. Variable stars. Distance indicators. Interstellar reddening. Related topics.

PHYS*7840 Advanced General Relativity W [0.50]

Review of elementary general relativity. Timelike and null geodesic congruences. Hypersurfaces and junction conditions. Lagrangian and Hamiltonian formulations of general relativity. Mass and angular momentum of a gravitating body. The laws of black-hole mechanics.

PHYS*7850 Quantum Field Theory for Cosmology U [0.50]

Introduction to scalar field theory and its canonical quantization in flat and curved spacetimes. The flat space effects of Casimir and Unruh. Quantum fluctuations of scalar fields and of the metric on curved space-times and application to inflationary cosmology. Hawking radiation.

Prerequisite(s): PHYS*7010

PHYS*7860 General Relativity for Cosmology U [0.50]

Introduction to the differential geometry of Lorentzian manifolds. The principles of general relativity. Causal structure and cosmological singularities. Cosmological space-times with Killing vector fields. Friedmann-Lemaître cosmologies, scalar vector and tensor perturbations in the linear and nonlinear regimes. De Sitter space-times and inflationary models.

PHYS*7870 Cosmology U [0.50]

Friedmann-Robertson-Walker metric and dynamics; big bang thermodynamics; nucleosynthesis; recombination; perturbation theory and structure formation; anisotropies in the Cosmic Microwave Background; statistics of cosmological density and velocity fields; galaxy formation; inflation.

PHYS*7880 Selected Topics in Astronomy U [0.50]

Offered on demand

Atomic and Molecular**PHYS*7100 Atomic Physics U [0.50]**

Emphasis on atomic structure and spectroscopy. Review of angular momentum, rotations, Wigner-Eckart theorem, n-j symbols. Energy levels in complex atoms, Hartree-Fock theory, radiative-transitions and inner-shell processes. Further topics selected with class interest in mind, at least one of which is to be taken from current literature.

PHYS*7130 Molecular Physics U [0.50]

Angular momentum and the rotation of molecules; introduction to group theory with application to molecular vibrations; principles of molecular spectroscopy; spectra of isolated molecules; intermolecular interactions and their effects on molecular spectra; selected additional topics (e.g., electronic structure of molecules, experimental spectroscopic techniques, neutron scattering, correlation functions, collision induced absorption, extension of group theory to molecular crystals, normal co-ordinate analysis, etc.).

Condensed Matter (Including Chemical Physics, and Conductivity and Superconductivity)**PHYS*7200 Liquid State Physics U [0.50]**

Physical properties of atomic liquids; distribution functions and equilibrium properties, elementary perturbation theories and integral equation theories; simple metals, simple computer simulation; viral expansions and thermodynamic derivatives of $g(r)$; experimental determination of $g(r)$.

PHYS*7310 Solid State Physics I U [0.50]

Phonons, electron states, electron-electron interaction, electron-ion interaction, static properties of solids.

PHYS*7320 Solid State Physics II U [0.50]

Transport properties; optical properties; magnetism; superconductivity; disordered systems.

PHYS*7330 Selected Topics in Theoretical Condensed Matter Physics U [0.50]**PHYS*7350 Photoconductivity and Luminescence U [0.50]**

Electron processes in crystals, photoconductive processes. Electrode effects, imperfection and energy band transitions, scattering traps and trapping effects. Recombination kinetics, luminescence. Experimental methods and analysis.

PHYS*7360 Optical Properties of Semiconductors U [0.50]

Reflection and refraction of electromagnetic waves at dielectric and conducting interfaces. Dispersion, absorption processes, photo effects, magneto-optical effects, emission of radiation.

PHYS*7650 Quantum Theory of Solid Surfaces U [0.50]

Brief historical review. Molecular orbital approach to surface and chemisorption states. Use of Kronig-Penny, Mathieu potential and Nearly-Free-Electron models. Crystal composition, next-nearest-neighbour interactions, sp- hybridization and applied-field effects on surface states will be discussed.

Biophysics**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*7530 Radiation Biophysics U [0.50]

Physical properties and biological effects of different kinds of radiation: action of radiation on various cellular constituents: target theory, genetic effects, repair of radiation damage, physics of radiology and radiotherapy, isotropic tracers.

PHYS*7540 Selected Topics in Experimental Biophysics U [0.50]

Offered on demand

PHYS*7550 Biophysics of Organ Systems U [0.50]

Specialized cells and organs; the nerve impulse and its propagation, muscle contraction, sensory transducers, the central nervous system; haemodynamics, the red-blood corpuscle, homeostasis; selected topics of current interest, and seminar.

PHYS*7570 Special Topics in Biophysics U [0.50]

Offered on demand

PHYS*8900 Interuniversity Graduate Course in Biophysics U [0.50]

This graduate course is offered using the combined biophysical resources of the Universities of Brock, Guelph, McMaster and Waterloo. Three topics constitute the equivalent of a one-semester 3 hr./week graduate course. Information about the course and the selection of individual topics can be obtained from the departmental course co-ordinator. Registration and credit will occur in the semester of the last module.

Applied Physics (including Technical Methods)**PHYS*7410 Electron Microscopy and Electron Diffraction U [0.50]**

Introduction to electron optics and the electron microscope; kinematical and dynamical theories of electron diffraction by perfect crystals and by crystals containing lattice imperfections, limited-area electron diffraction, dark-field microscopy, interpretation of electron-diffraction patterns and diffraction-contrast effects in electron microscope images, selected experimental methods in electron microscopy.

PHYS*7420 Basic Theory of Nuclear Magnetic Resonance * U [0.50]

Quantum mechanics of spins in magnetic field; Bloch equations; NMR apparatus; the various nuclear-spin interactions; spin temperature; density matrix; spin-lattice relaxation; double resonance.

PHYS*7450 Selected 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*7460 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*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.

PHYS*7480 Microprocessors in the Physics Laboratory U [0.50]

Interfacing and programming of microprocessors for applications in physics, including signal averaging, auto- and cross-correlation analysis, multichannel spectrum analysis, and Fourier transformation. Consideration of hardware versus software methods for optimization of speed and system size.

Special Courses (offered on demand only)**PHYS*7120 Selected Topics in Theoretical Physics U [0.50]****PHYS*7710 Special Lecture and Reading Course U [0.50]****PHYS*7720 Selected Seminar and Module Course (for inter-departmental students) U [0.50]****PHYS*7730 Special Topics in Physics U [0.50]****PHYS*7750 Interinstitution Exchange U [0.50]****PHYS*7970 MSc Project U [1.00]**

At the director's discretion, a PhD student may receive course 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 Plant Agriculture offer specialization in the fields of crop management and physiology, crop breeding and genetics and crop biotechnology. Crop management and physiology is adaptation of scientific principles to improve performance of field and horticultural crops in a number of different types of environment. Research areas include closed environment production systems, plant water relations, plant growth regulations, optimization of yield and quality and post harvest physiology and biochemistry, breeding methodology, germplasm development and phytoremediation. Crop breeding and genetics includes techniques to develop or improve germplasm using selection procedures, improvement of methodologies in plant breeding and to develop an understanding of genes at the whole plant level. Students may also focus on plant propagation and plant cell and tissue culture. Crop biotechnology emphasizes the use of molecular biology techniques such as transformation, RFLP and RAPD's to develop novel germplasm and study gene function.

Administrative Staff

Chair (Interim)

Gary R. Ablett (314 Crop Science, Ext. 53386)
gablett@uoguelph.ca

Acting Graduate Co-ordinator

Duane Falk (209/210 Crop Science, Ext. 53579)
dfalk@uoguelph.ca

Graduate Secretary

Jean G. Wolting (1105 Bovey Building, Ext. 56077)
jwolting@uoguelph.ca

Graduate Faculty

Gary R. Ablett

BSc Waterloo, MSc, PhD Guelph - Associate Professor and Interim Chair

Theo Blom

BSc Wageningen, PhD Guelph - Associate Professor

Stephen R. Bowley

BS, MSc Guelph, PhD Kentucky - Associate Professor

Calvin Chong

BBsc, MSc, PhD McGill - Professor

Chun-Lung (George) Chu

BSc National Chung-Hsing, MSc Guelph, PhD Washington State - Associate Professor

E. Ann Clark

BS, MS California, PhD Iowa State - Associate Professor

John Cline

BSc Guelph, MSc Michigan State, PhD London UK - Assistant Professor

Adam Dale

BSc, PhD Sheffield - Professor

William Deen

BSc, MSc, PhD Guelph - Assistant Professor

Hugh J. Earle

BSc, MSc Guelph, PhD Western Ontario - Assistant Professor

Larry R. Erickson

BA Western Ontario, BSc, MSc, PhD Guelph - Associate Professor

Duane E. Falk

BSc, MSc Montana State, PhD Guelph - Associate Professor

K. Helen Fisher

BSc, MSc Guelph, PhD Cornell - Assistant Professor

Bernard Grodzinski

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

Katerina S. Jordan

BS, MS Maryland, PhD Rhode Island - Assistant Professor

Elizabeth A. Lee

BSc Minnesota, MSc Iowa State, PhD Missouri - Assistant Professor

Lewis Lukens

BSc Carleton College, PhD Minnesota - Assistant Professor

Glen P. Lumis

BS Pennsylvania State, MS, PhD Michigan State - Professor

Eric M. Lyons

BSc Northern Iowa, PhD Pennsylvania State - Assistant Professor

Jaideep Mathur

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

Mary Ruth McDonald

BSc, MSc, PhD Guelph - Associate Professor

Alan W. McKeown

BSc, MSc Guelph, PhD Michigan - Associate Professor

Robert J. McLaughlin

BSc (Agr), PhD Guelph - Professor

Barry Micallef

BSc, MSc Guelph, PhD Wisconsin-Madison - Assistant Professor

John O'Sullivan

BSc, M(Agr.)Sc Dublin, PhD Wisconsin - Associate Professor

Gopi Paliyath

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

K. Peter Pauls

BSc, MSc, PhD Waterloo - Professor

Douglas Powell

BSc, PhD Guelph - Associate Professor

John T.A. Proctor

BSc Reading, MS, PhD Cornell, FASHS, FAIC Hort - Professor

Manish Raizada

BSc Western, PhD Stanford - Assistant Professor

Istvan Rajcan

BSc Novi Sad, Yugoslavia, PhD Guelph - Associate Professor

Danny L. Rinker

BSc Philadelphia College of Pharmacy and Science, MED Millersville Univ. of Pennsylvania, PhD Pennsylvania State - Associate Professor

Praveen K. Saxena

BSc Meerut, MSc Lucknow, PhD Delhi - Associate Professor

Arthur W. Schaafsma

BSc, MSc, PhD Guelph - Associate Professor

Barry J. Shelp

BSc, MSc Brock, PhD Queen's - Professor

Peter Sikkema

BSc, MSc Guelph, PhD Western Ontario - Assistant Professor

Judith Strommer

BS, MS Chicago, PhD California - Associate Professor

Jayasankar Subramanian

BSc, MSc TamilNadu Agricultural (India), PhD Florida - Assistant 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

Matthijs Tollenaar

IR. Wageningen, PhD Guelph - Professor

David J. Wolyn

BS Rutgers, MS, PhD Wisconsin - Associate Professor

MSc Program

The Department of Plant Agriculture offers an MSc program in the fields of crop management and physiology, crop breeding and genetics and crop biotechnology. Students will 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 into the fall, winter or summer semesters. The University of Guelph requires that applicants from some foreign institutions have an 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 (if any) is established with the student's advisory committee. All MSc candidates must complete a thesis. Students are required to participate in the Seminar (PLNT*6500) and in one Departmental Colloquium course. In addition, a thesis seminar will be presented in conjunction with the final oral examination and thesis defence. Students are encouraged to participate in the Annual Poster Day sponsored by the Department.

PhD Program

The Department of Plant Agriculture offers a PhD program in the fields of crop management and physiology, crop breeding and genetics and crop biotechnology

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. On rare occasions direct admission to the PhD program

will be permitted to applicants holding an honours baccalaureate degree who have demonstrated extraordinary academic and research capabilities. It is also possible for a student to transfer from the MSc program without completing the requirements for that degree provided the student has an excellent academic record and has demonstrated a strong aptitude for research which can be expanded to the doctoral level. Applicants should submit a statement of research interests, background experiences, and career goals to assist in the identification of a faculty adviser who has the resources necessary to support the thesis research. Students may be admitted into the fall, winter or spring semesters. In some instances (see MSc admission requirements) applicants who already hold an MSc may be required to initially register in the MSc program.)

Transfer from the MSc Program to the PhD Program

Students enrolled in the MSc program who demonstrate exceptional research and academic capabilities may request to be transferred to the PhD program. The request for transfer must be initiated by the student and must be done no sooner than the end of the second semester and no later than the end of the fourth semester.

Degree Requirements

The major emphasis in the PhD program is on research and the preparation of an acceptable thesis. There are no specific course requirements except for the seminar and colloquia as outlined below. However, it is usual 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 of their field of specialization and related topics. The qualifying examination will be taken no later than the fifth semester or seventh semester if the student has transferred from the MSc program or has been admitted directly to the PhD program with only a BSc. In addition, 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.

Students are required to participate in the Seminar (PLNT*6400). PhD students will complete a second seminar (PLNT*6410) on their thesis research no later than semester 6. In addition, a thesis seminar will be presented in conjunction with the final oral examination and thesis defence. Students are required to participate in two Departmental Colloquium courses offered by the Department. Students are encouraged to participate in the Annual Poster Day sponsored by the Department. The PhD program is completed by the submission and successful defence of an acceptable thesis.

Interdepartmental Programs

Toxicology MSc/PhD Collaborative Program

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

Crop Breeding, Genetics, and Biotechnology

PLNT*6100 Advanced Crop Breeding F [0.25]

The practical application of genetic theory and biological limitations to improving plant populations as germplasm and for cultivar development will be presented and discussed. Sources of variation, selection methods, genotype evaluation and cultivar multiplication will be addressed in lectures and discussions.

PLNT*6120 Protein and Oilseed Crop Breeding F [0.25]

This course will address both theoretical and practical aspects of protein and oilseed crop breeding. Current and emerging breeding methodologies to achieve major agronomic and compositional goals will be examined from the perspective of theoretical, technical and financial efficiencies.

PLNT*6130 Corn Breeding W [0.25]

Principles of corn breeding with emphasis on germplasm enhancement and methods of improving breeding populations as sources of inbred lines for hybrid programs and for direct use as improved varieties

PLNT*6150 Plant Breeding -The Profession W [0.25]

The course will address professional aspects of plant breeding including: legal/regulatory issues, ethical issues related to germplasm, and rights and responsibilities related to intellectual property under UPOV and World Patent Organization conventions.

PLNT*6160 Quantitative Genetic Variation in Crop Populations F [0.25]

Fundamentals of quantitative genetics. Topics will include gene and genotype frequencies, forces affecting equilibrium, small population size, inbreeding, means, variances, covariances and resemblance among relatives. Lecture topics will be expanded through discussion of classic and current papers.

PLNT*6250 Colloquium in Genetics, Biotechnology and Plant Breeding F,W [0.25]

An open discussion course designed to review and critically analyse contemporary issues in plant genetics, biotechnology and breeding.

PLNT*6260 Advanced Crop Genetics W [0.50]

A lecture and discussion course on some of the recent advances in genetics as they pertain to crop improvement. Topics will include: the molecular basis of selected agronomic traits, molecular marker assisted selection, isolation of plant genes and plant transformation systems.

Crop Physiology and Management

PLNT*6010 Physiology of Crop Yield W [0.50]

Physiological and environmental principles as they relate to the growth of crop plants and communities. Plant and environmental characteristics determining transpiration, photosynthesis, leaf growth and reproductive growth and development. Simulation of plant growth.

External Course Code(s): Offered in even years.

PLNT*6110 Postharvest Physiology W [0.50]

Discussion of the physiological effects of controlled and supplemental environments or treatments on horticultural crops. Emphasis is on current problems and research.

External Course Code(s): Offered in odd years.

PLNT*6220 Advanced Studies in Pomology W [0.50]

Discussion of current problems and research on fruit crop production and physiology.

External Course Code(s): Offered in even years

PLNT*6230 Colloquium in Crop Physiology and Management F,W [0.25]

An open discussion and/or workshop course designed to review and critically analyze contemporary issues in crop physiology and management. The fall course is generally devoted to computer simulation of crop growth and development.

PLNT*6240 Colloquium on Weed Management in Agrosystems W [0.25]

An open discussion course designed to review and critically analyze contemporary issues in plant ecology and their relevance to practical weed management systems.

PLNT*6290 Physiological Genetics of Higher Plants F [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.

External Course Code(s): Offered in odd years.

PLNT*6490 Colloquium in Physiology of Ornamental Crops F [0.50]

Current topics in the area of floriculture, turfgrass, and woody plant physiology.

External Course Code(s): Offered in even years.

General

PLNT*6020 Issues in Food Safety Risk Analysis S [0.50]

This course is based on the principles of risk analysis - assessment, management and communication - their application to food safety, agricultural biotechnology and food policy development

PLNT*6030 Food Safety Policy W [0.50]

This course will examine the interplay between science, risk, economics and politics that lead to food safety policy development. Students will be introduced to national and international approaches to food safety policy, as well as in-depth case studies. Lectures, readings and resource material will focus on real-life development of food safety policy, drawing on the experience of a number of distinguished lecturers who have participated in a broad range of food safety policy developments.

PLNT*6050 Principles and Application of Plant Tissue Culture F [0.50]

The course involves lecture and discussions of fundamental and applied aspects of plant tissue culture. Topics will include the role of tissue culture in understanding plant development, physiology and genetics, and its commercial applications in horticulture and forestry.

External Course Code(s): Offered in odd years.

PLNT*6170 Statistics in Plant Agriculture W [0.50]

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.

PLNT*6400 Seminar F,W [0.25]

All graduate students present a departmental seminar on their research proposal no later than the second semester. PhD students present an additional seminar on their thesis research before the end of the sixth semester (or the equivalent). Each student is expected to participate in the seminars of colleagues and faculty.

PLNT*6410 Advanced Seminar F-W [0.25]

PhD students present a seminar on their research to date before the end of the sixth semester (or the equivalent). Each student is expected to participate in the seminars of colleagues and faculty.

Prerequisite(s): PLNT*6400

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 phylogenics, 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*2020).

Political Science

Administrative Staff

Chair

Ken Woodside (626 MacKinnon, Ext. 56503)
kwoodsid@uoguelph.ca

Graduate Co-ordinator

Janine Clark (637 MacKinnon, Ext. 52927)
jclark@uoguelph.ca

Graduate Secretary

Millie MacQueen (623 MacKinnon, Ext. 53895)
mmacquee@uoguelph.ca

Graduate Faculty

Wm. Christian

BA, MA Toronto, PhD London School of Economics - Professor

Janine Clark

BES, MA Carleton, PhD Toronto - Associate Professor

Carol L. Dauda

BA McMaster, MA, PhD Guelph - Assistant Professor

Jordi Diez

BA Toronto, MA Essex, PhD Toronto - Assistant Professor

Fred Eidlin

BA Dartmouth, MA Indiana, PhD Toronto - Professor

Candace Johnson

BA Toronto; MA, PhD Dalhousie - Assistant Professor

Craig A. Johnson

BA Queen's, MA Toronto, PhD London School of Economics - Associate Professor

Theresa M.L. Lee

BA Toronto, MA, PhD Princeton - Associate Professor

Maureen Mancuso

BA McMaster, MA Carleton, DPhil Oxford - Professor, Provost and Vice-President Academic

Tim A. Mau

BA, MA Guelph, PhD Oxford - Assistant Professor

Judith McKenzie

BES Waterloo, MA, PhD Toronto - Associate Professor

Richard W. Phidd

BA Sir George Williams, MA Carleton, PhD Queen's - Professor

Troy Riddell

BA, MA Calgary, PhD McGill - Associate Professor

Ian S. Spears

BA Toronto, MA Queen's, PhD McGill - Assistant Professor

R. Brian Woodrow

BA, MA, PhD Toronto - Professor

Kenneth B. Woodside

BA Toronto, MA, PhD Chicago - Professor and Chair

MA Program

The Department of Political Science offers programs of study leading to the MA degree. Students may pursue either a thesis option or a major paper option, both of which are research-based.

The MA program's focus is on three fields: the Americas, public policy and administration, and international and comparative development. The Americas field includes the study of the government and politics of Canada, the United States, and Latin America and the Caribbean from a comparative and theoretical perspective. The public policy and administration field includes the study of the operation and management of governmental institutions and selected areas of public policy. The international and comparative development field includes both area studies and theories of development which link these areas.

The department works jointly with the Department of Political Science at McMaster University in offering a collaborative program in public policy and administration. Faculty members in the department also participate in the Collaborative International Development Studies program. The MA program can be completed in three semesters. Students who are admitted will normally receive funding as a Graduate Teaching Assistant or a Graduate Research Assistant.

Application Procedure

Graduate students are admitted each fall semester (approximately 15 students). The deadline for all application material is February 1 each year. The application fee is currently \$75 in the form of a certified cheque or money order. Information required is as follows:

- Application form or the PDF file from the on-line application procedure
- One page statement of interest

- All official transcripts
- Two letters of reference with assessment forms (part of application form)

You may apply in one of three ways:

- On-line -- we encourage you to use this method
- Download an application form
- Submit a request for an application package

www.uoguelph.ca/GraduateStudies/admission.htm

is the site for all three methods of application.

NOTE: This is a self-administered application process. Please have all materials (reference letters, transcripts, application form, letter of intent) returned to you and you put everything in one envelope and send to the Department of Political Studies Graduate Program Secretary.

Admission Requirements

The department requires an Honours BA degree (4 years) in political science (or its equivalent) with at least a 'B' average (second-class standing) 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 the Fields of the Americas, Public Policy and Administration, and International and Comparative Development

In order to fulfill the requirements of the MA degree, students must complete the requirements of either the thesis or the major paper options.

Thesis option:

Students pursuing the thesis option will select one major field from the following: the Americas, Public Policy and Administration, or International and Comparative Development. In order to satisfy the degree requirements, the student will complete four courses plus Pro-Seminar and a thesis as described below for a total of 2.25 credits.

One professional development and orientation course:

POLS*6900 0.25 Pro-Seminar

One of the following field core courses:

POLS*6250 0.5 Comparative Governments in the America
POLS*6630 0.5 Public Policy and Administration: Theory and Practice
POLS*6730 0.5 The Politics of Development and Underdevelopment

One methodology course:

POLS*6940 0.5 Political Research: Theories and Approaches
or an approved equivalent from another department

Two of the following departmental courses:

POLS*6210 0.5 Canadian Politics: Processes and Culture
POLS*6290 0.5 The American Political System
POLS*6370 0.5 Latin America and the Caribbean
POLS*6390 0.5 Environmental Policy and Law
POLS*6450 0.5 The Political Economy of Trade Policy
POLS*6640 0.5 Canadian Public Administration: Public Sector Management

POLS*6650 0.5 Organization and Decision-Making Theory

POLS*6750 0.5 Development Administration

POLS*6950 0.5 Specialized Topics in Political Science

Courses from other departments with the approval of the department chair.

With the permission of the Graduate Committee, complete and successfully defend a thesis of no more than 20,000 words.

Major Paper option

Students pursuing the major paper option will select two major fields from the following: the Americas, Public Policy and Administration, or International and Comparative Development. In order to satisfy the degree requirements, the student will complete six courses plus 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

Two of the following field core courses:

POLS*6250 0.5 Comparative Governments in the America
POLS*6630 0.5 Public Policy and Administration: Theory and Practice
POLS*6730 0.5 The Politics of Development and Underdevelopment

One methodology course:

POLS*6940 0.5 Political Research: Theories and Approaches
or an approved equivalent from another department

Three of the following departmental courses:

POLS*6210 0.5 Canadian Politics: Processes and Culture
POLS*6290 0.5 The American Political System
POLS*6370 0.5 Latin America and the Caribbean

POLS*6390	0.5	Environmental Policy and Law
POLS*6450	0.5	The Political Economy of Trade Policy
POLS*6640	0.5	Canadian Public Administration: Public Sector Management

POLS*6650	0.5	Organization and Decision-Making Theory
POLS*6750	0.5	Development Administration
POLS*6950	0.5	Specialized Topics in Political Science

Courses from other departments with the approval of the graduate coordinator or department chair.

Complete a major research paper of approximately 10,000 words:

POLS*6970	1.0	Research for Major Paper
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Interuniversity Program - Guelph-McMaster Collaborative MA Program in Political Science in the Field of 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 - like economics, law and sociology.

Graduates enjoy successful careers in the public services of Canada, Ontario and other provinces, plus local governments. Some work for businesses and others for interest associations and non-governmental organizations. A number of graduates have pursued PhD's and now teach in universities and colleges.

Course of Study

The fall and winter semesters consist of all core courses and 2 specialized electives. The summer semester differs for students who are formally enrolled at Guelph and those formally enrolled at McMaster.

Category A: Core Courses

Students must complete all core courses. Public Policy and Administration Research Seminar will be offered in alternating weeks at both universities during one of the fall or winter semesters.

POLS*6630 or MCM*7830	Public Policy Analysis
POLS*6640 or MCM*7850	Canadian Public Administration: Public Sector Management
POLS*6940	Political Research: Theories & Approaches
or	
MCM*7960	Research Design and Methods
POLS*6950 or MCM*7940	Public Policy & Admin. Research Seminar
POLS*6900	Proseminar (Guelph Students)

Category B: Specialized Electives

Students may choose two additional courses from the annual listing of specialized courses offered at both McMaster and Guelph.

Category C: Summer Semester:

POLS*6970 Major Paper (Guelph students)
Students at Guelph will research and write a major paper (approximately 10,000 words) to be graded by the student's advisor and second reader (advisory committee).

Students at McMaster will write comprehensive examinations in mid July in the major field of Public Policy and Administration and in a minor field chosen from Canadian Politics, Comparative Politics or International Relations.

Interdepartmental Programs

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. Included in the graduate faculty for this program are J. Clark, C. Dauda, J. Diez, Craig Johnson, and I. Spears. 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.

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.

Thesis option in the CIDS program:

Students pursuing a thesis option will complete six courses plus 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

- Five CIDS core courses: (See the Collaborative International Development Program entry in this calendar (2.50)

- One methodology course:

POLS*6940	0.5	Political Research: Theories and Approaches or an approved equivalent course from another department.
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- One departmental graduate course (0.5).

- With the permission of the Graduate Committee, complete and successfully defend a thesis of no more than 20,000 words.

Major Paper option :

Students pursuing the major paper option will complete eight courses plus Proseminar and a major paper as described below for a total of 5.25 credits.

- One professional development and orientation course:

POLS*6900	0.25	Pro-Seminar
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- Five CIDS core courses: See Collaborative International Development Program entry in this calendar (2.50)

- One methodology course:

POLS*6940	0.5	Political Research: Theories and Approaches or an approved equivalent course from another department.
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- Two departmental graduate courses (1.0).

- POLS*6970 1.0 Major Paper

Courses

(* core course)

The Americas

POLS*6210 Canadian Politics: Process and Culture U [0.50]

This course begins with a study of the works of democratic theorists, Canadian and foreign. Conclusions drawn from this analysis are then applied to our political institutions and processes with a view to their evaluation and reform in accordance with the democratic ideal.

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*6370 Latin America and the Caribbean U [0.50]

The analysis of the political development of Latin America and the Caribbean looking at the context, ideologies, structures, processes and effects of policy formulation and implementation.

Public Policy and Administration

POLS*6390 Environmental Policy and Law U [0.50]

Examination of the policy, institutions, processes and legal procedures which encompass the field of environmental policy-making and law in Canada.

POLS*6450 The Political Economy of Trade Policy U [0.50]

This course examines international trade policies - multilateral, bilateral and unilateral - from a political economy perspective with particular attention to the evolving World Trade Organization as well as regional experiences under NAFTA and the European Union.

POLS*6630 Public Policy and Administration: Theory and Practice U [0.50]

This course provides an overview of important contributions in the study of public policy and public administration. It reviews a number of theories of the state and the literatures which have grown up around them. It also covers a range of narrower areas of public policy and administration such as organization theory, public budgeting and regulation and the literatures which they have generated.

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*6650 Organization and Decision-Making Theory U [0.50]

This course reviews a variety of theories and models used for explaining public sector organization behaviour. The models include economics, political science, contingency and institutional approaches. The theories and models are then used to examine actual behaviour in a variety of public sector organizations.

MCM*7970
MCM*798P

Readings in Comparative Public Policy
Environmental Policies and Governance

International and Comparative Development**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 Administration U [0.50]

This course traces the roots of the developmental paradigm and the emergence of a unique administrative mechanism to handle the development goals of Third World nations. Special issues for discussion include: the cultural context of development administration, sustainable development, technology transfer, corruption and administrative accountability.

Methodology and Research Courses**POLS*6940 Political Research: Theories and Approaches U [0.50]**

This course provides an introduction to the nature of empirical social science by examining the major theoretical approaches to the study of politics. It is designed to encourage students to understand and critically assess the potential and limitations in each. Accordingly, a comprehensive survey of the philosophical assumptions and the methodological issues underlying political inquiry and analysis are undertaken, with a focus on the fields of study in the departmental graduate program.

POLS*6950 Specialized Topics in Political Studies U [0.50]

This course is intended to be an elective course for students wishing to pursue an area of investigation not covered in the other courses offered by the department. This course may also be chosen by students who want to further pursue a subject area to which they were introduced in a previous course.

Other**POLS*6900 Pro-Seminar U [0.25]**

This course is a 0.25 credit course introducing students to graduate studies in the department and to the profession of political science. It includes information on the following: formation of a student's faculty advisory committee; preparation of research proposals for thesis and major papers; library orientation; research using the WWW and computers; and discussion of faculty research. All graduate students are required to take this course. The course is graded satisfactory (SAT) or unsatisfactory (UNS).

POLS*6960 Directed Readings U [0.50]

This is an elective course for students wishing to pursue an area of investigation not covered in other courses offered by the department. This course may also be chosen by students who want to further pursue a subject area to which they were introduced in a previous course.

POLS*6970 Major Paper U [1.00]

The major paper is an extensive research paper for those who do not elect to complete a thesis. It may be taken over two semesters. The length of the major paper is not to exceed 10,000 words.

Courses at McMaster University available to students in the collaborative MA program

MCM*7010	Theory and Practice of Policy Analysis: Frameworks and Models
MCM*7470	Welfare States in Comparative Perspective
MCM*7480	Democracy and Diversity: Multicultural Policies in Comparative Perspective
MCM*753P	Political Theory and Public Policy
MCM*7740	International Political Economy
MCM*7820	Development Theory and Administration
MCM*7830	Comparative Public Policy
MCM*7840	Statistical Analysis for Public Policy
MCM*7850	Canadian Public Administration: Public Sector Management
MCM*7860	Organizational Theory and the Public Sector
MCM*7870	Intergovernmental Relations and Public Policy-Making
MCM*7900	Politics of Economic Policy in Market Economies
MCM*7920	Public Choice
MCM*7930	Research Seminar in Public Administration
MCM*7940	Research Seminar in Public Policy
MCM*7950	Research Project in Public Policy
MCM*7960	Research Design and Methods for Comparative Public Policy

Population Medicine

The Department of Population Medicine is an international leader in promoting the optimal health and productivity of animal populations, ensuring the safety of foods of animal origin and preventing animal-related disease in humans.

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, PhD and DVSc degrees.

Administrative Staff

Interim Chair

Scott McEwen (CLRE207B OVC, Ext. 54751)
smcewen@ovc.uoguelph.ca

Acting Graduate Co-ordinator

Robert Friendship (CLRE103 OVC, Ext. 54022)
rfriends@ovc.uoguelph.ca

Graduate Secretary

Mary Elliott (CR2509 OVC, Ext. 54780)
melliott@uoguelph.ca

Graduate Faculty

Cindy L. Adams

BSW Western Ontario & Calgary, MSW Calgary, PhD Guelph - Assistant Professor

Kenneth G. Bateman

DVM, MSc Guelph - Associate Professor

Olaf Berke

Dipl. Statistics, PhD Dortmund Germany - Assistant Professor

Tracey S. Chenier

DVM, DVSc Guelph - Assistant Professor

Catherine E. Dewey

DVM, MSc, PhD Guelph - Professor

Todd F. Duffield

DVM, DVSc, Guelph - Associate Professor

Robert M. Friendship

DVM, MSc Guelph - Professor

Cathy J. Gartley

BSc New Brunswick, DVM, DVSc Guelph, Dip ACT - Assistant Professor

Walter H. Johnson

DVM, MVSC Saskatchewan, Dip ACT - Professor

David F. Kelton

DVM, MSc, PhD Guelph, Dip ABVP - Associate Professor

Stephen J. LeBlanc

BSc McGill, DVM, DVSc Guelph - Assistant Professor

Kenneth E. Leslie

DVM, MSc Guelph - Professor

Kerry D. Lissemore

BSc Toronto, DVM, DVSc Guelph - Associate Professor

S. Wayne Martin

DVM, MSc Guelph, MPVM, PhD California - Professor

John J. McDermott

DVM Guelph, MPVM California, PhD Guelph - Professor

Scott A. McEwen

DVM, DVSc Guelph, Dip. ACVP - Professor and Interim Chair

Alan H. Meek

DVM, MSc Guelph, PhD Melbourne - Professor

Paula I. Menzies

DVM Guelph, MPVM California - Associate Professor

Suzanne T. Millman

BSc, PhD Guelph - Assistant Professor

Peter W. Physick-Sheard

BVSc Bristol, Dip Vet Surg, MSc Guelph, FRCVS (UK) - Associate Professor

Carl S. Ribble

BSc British Columbia, DVM, MSc Saskatchewan, PhD Guelph - Professor

David Sandals

DVM, MSc Guelph - Associate Professor

Margaret A. Thorburn

BSc Stanford, DVM, MPVM, PhD California - Associate Professor

David Waltner-Toews

BA Goshen College (Indiana), DVM Saskatchewan, PhD Guelph - Professor

Jeffrey B. Wilson

DVM, DVSc, PhD Guelph - Associate Professor

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.

Degree Requirements

MSc by Thesis

The prescribed studies for our research-based MSc are a minimum of four courses (at least 2.0 course credits) appropriate to the discipline. Epidemiology I (POPM*6200) is a required course for students in epidemiology; students in health management and theriogenology must take either Epidemiology I (POPM*6200) or Applied Clinical Research (POPM*6950). A minimum of 'B-' average is required in the prescribed studies. The department seminar course, POPM*6100, is also required but does not count as one of the four courses. A thesis must be completed and successfully defended.

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 dean 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 eight courses. Normally, the prescribed courses for the MSc in Epidemiology by course work will include:

Prescribed Courses:

POPM*6200	Epidemiology I (F)
POPM*6210	Epidemiology II (W)
POPM*6250	Project in Epidemiology (F, W, S)

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:

POPM*6290	Statistics for the Health Sciences (W)
POPM*6300	Epidemiology of Zoonoses (W)
POPM*6350	Safety of Foods of Animal Origin (F)
POPM*6950	Directed Studies in Population Medicine
STAT*6950	Statistical Methods for the Life Sciences (F)
STAT*6920	Topics in Statistics (Topics in Regression Analysis) (F) (or equivalent)
STAT*3510	Environmental Risk Assessment (W)
POPM*6700	Swine Health Management (W - alternate years)
POPM*6400	Dairy Health Management (S - alternate years)
STAT*6960	Design of Experiments and Data Analysis for the Life Sciences (W)

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 not 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. Recognized areas of specializations include theriogenology, ruminant-health management, and swine-health management. Admission and degree requirements are outlined in the Policies and Procedures Manual for the DVSc Program. Interested individuals can obtain such information by writing directly to the assistant dean, research and graduate studies, of the Ontario Veterinary College.

Interdepartmental Programs

Food Safety and Quality Assurance MSc Collaborative Program

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 collaborative program.

International Studies Collaborative MSc Program

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 interdepartmental 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.

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.

POPM*6290 Statistics for the Health Sciences W [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*6200 or STAT*2040 or equivalent

POPM*6300 Epidemiology of Zoonoses W [0.50]

Characterization and distribution of diseases common to man and animals.

Swine Health Management

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.

Veterinary Medicine

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.

Veterinary Public Health/Food Safety

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.

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.

Psychology

The Department of Psychology offers two graduate programs. The first is a Master of Arts (MA) in four fields of study: Applied Cognitive Science, Applied Social Psychology, Clinical Psychology: Applied Developmental Emphasis, and Industrial/Organizational Psychology. The second program is a Doctor of Philosophy (PhD) in the same four fields of study. These fields of study, which are described below, all follow a scientist-practitioner model and provide training in both research and professional skills, as well as a firm grounding in theory and research in relevant content areas. See the department website at <http://www.psychology.uoguelph.ca> for additional information.

Administrative Staff

Acting Chair

Serge Desmarais (515 MacKinnon, Ext. 58754)
desmarais@psy.uoguelph.ca

Graduate Co-ordinator

Benjamin H. Gottlieb (535 MacKinnon, Ext. 53513)
gottlieb@psy.uoguelph.ca

Graduate Secretary

Robin Fraser (524 MacKinnon, Ext. 53508)
rfraser@psy.uoguelph.ca

Graduate Faculty

Heidi N. Bailey

BA British Columbia, PhD Western - Assistant Professor

Marcia A. Barnes

MA, PhD McMaster - Associate Professor, University Research Chair

Roderick W. Barron

BA Occidental, MA, PhD Ohio State - Professor

Elena Choleris

BSc, PhD Parma (Italy) - Assistant Professor

Steven F. Cronshaw

BA, B.Comm Saskatchewan, MA, PhD Akron - Professor

Ernest Dalrymple-Alford

BSc, PhD London - Professor Emeritus

Hank Davis

BA Columbia, MA Boston, PhD Maryland - Professor

Donald Dedrick

BA, MA Carleton, PhD Toronto - Assistant Professor, Department of Philosophy

Serge Desmarais

BA, MA PhD Waterloo - Professor, Canada Research Chair

Brian M. Earn

BA Manitoba, MA, PhD Toronto - Professor

Mary Ann Evans

BA Toronto, MA, PhD Waterloo - Professor

Harjinder Gill

BA Waterloo, MA, PhD Western Ontario - Assistant Professor

Benjamin H. Gottlieb

AB, MSW, PhD Michigan - Professor

Michael P. Grand

BA Toronto, PhD SUNY at Stony Brook - Professor

Peter Hausdorf

BSc McMaster, MA Guelph, PhD McMaster - Associate Professor

Karl Hennig

BEd, MA, PhD British Columbia - Assistant Professor

Thomas F. Herrmann

BS SUNY at Brockport, PhD Tennessee - Professor

John Hundleby

MA Edinburgh, PhD Penn State - Professor Emeritus

Mary M. Konstantareas

BA, MA, PhD Toronto - University Professor Emeritus

Karen S. Korabik

AB, MS, PhD Saint Louis - Professor

Francesco Leri

BA, MA, PhD McGill - Assistant Professor

Ian R. Lubek

BA Toronto, PhD SUNY at Stony Brook - Professor

Harvey H.C. Marmurek

BA Toronto, MA, PhD Ohio State - Professor and Chair

Michael L. Matthews

BA, PhD Nottingham - Professor

Daniel V. Meegan

BA SUNY at Albany, PhD McMaster - Associate Professor

Barbara A. Morrongiello

BA Douglass College (Rutgers), MS, PhD Massachusetts - Professor

Ian R. Newby-Clark

BSc Toronto, PhD Waterloo - Assistant Professor

Michael H. Peters

BSc Alberta, MSc Calgary, PhD Western Ontario - Professor

Saba F. Safdar

BA McMaster, MA, PhD York - Assistant Professor

Leanne S.M. Son Hing

BA Queen's, MA, PhD Waterloo - Assistant Professor

David Stanley

BA Waterloo, MA, PhD Western Ontario - Assistant Professor

Lana M. Trick

BSc Calgary, MA, PhD Western Ontario - Associate Professor

Andrew S. Winston

BA Northwestern, MA, PhD Illinois - Professor

Linda A. Wood

BA Toronto, MA Michigan, PhD York - Professor

A. Daniel Yarmey

BA, MA, PhD Western Ontario - University Professor Emeritus

Applied Cognitive Science

Cognitive Science is an interdisciplinary field that involves the empirical study of intelligent systems (human, animal, or machine) to answer questions about the nature of knowledge, its sources, development, and use. It encompasses cognitive psychology, neuroscience, evolutionary biology, philosophy, and computer science/engineering. The field of Applied Cognitive Science involves three components: courses, practica, and research. In addition to the Department of Psychology, faculty members from the Departments of Philosophy, Computing and Information Systems, Engineering, and Human Health and Nutritional Sciences are involved in course instruction and research supervision. Training in Applied Cognitive Science provides students with skills to become researchers and professionals and prepares them for careers in teaching, research, and/or policy-making in areas related to perception, cognition, and performance in a variety of settings including education, government, health, and business.

Applied Social Psychology

Applied Social Psychology is based on the investigation of social processes and problems of significance to the general community and to specific groups, for example, in the areas of aging, health, law, equity, community services, and gender. The field of Applied Social Psychology has two primary components: first, the pursuit of advanced research, and second, the design and evaluation of interventions and programs that aim to reduce social problems and promote human welfare. The Researcher/Practitioner Course Set emphasizes field research, practicum training, and consulting in community settings. It is designed for students who wish to pursue either an academic/researcher or a practitioner career path (e.g. to work primarily in government, consulting firms, community agencies, foundations, and hospitals). The Researcher Course Set involves training in advanced methodological and analytic techniques and emphasizes involvement in the ongoing research projects of the faculty. This course set is designed for students interested in an academic/research career path.

Clinical Psychology: Applied Developmental Emphasis

The field of Clinical Psychology: Applied Developmental Emphasis concentrates on understanding the development and treatment of psychological disorders experienced by children, youth and families. This includes a focus on the social, emotional, cognitive, and neurobiological features of normal and atypical development; risk and protective factors that influence the nature and progression of atypical development and response to treatment; and approaches to assessment, psychodiagnosis, and intervention. Also considered is the developmental impact of stressful life events such as divorce, illness, poverty, adoption, and death. Training in this field follows an integrated series of courses and practica which contributes to and mutually supports the students' acquisition of competence as both practitioners and researchers. Students participate in our on-campus clinic, the Centre for Psychological Services, and complete off campus practica in hospitals, schools and mental health settings under the supervision of registered psychologists. This training allows students to enter careers involving clinical and/or research positions in mental health centres, hospitals, schools, and the private sector, as well as careers involving teaching and research in university settings. It also prepares students for registration as psychologists with provincial licensing boards.

Industrial/Organizational Psychology

The objective of study in the field of Industrial/Organizational Psychology is to train future professionals in the field 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 application fees. 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. Graduate Record Examination (GRE) General and Subject (Psychology) test scores are required of all applicants for MA and PhD programs. Applicants should request that their GRE scores be sent directly to the Department of Psychology before the January 15 application deadline. Contact the Graduate Secretary, Department of Psychology, at psygsec@psy.uoguelph.ca for additional information.

MA Program

Admission Requirements MA Program

Consideration for admission to the MA program will be given to students with an honours BA or BSc (or its equivalent) in Psychology or an allied field (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 MA program with the understanding that they intend to proceed to the PhD program.

Degree Requirements MA Program

Applied Cognitive Science

PSYC*6060 Research Design and Statistics
 PSYC*6880 Ethical Issues in Psychology
 and five other courses as follows:
 PSYC*6471 Practicum I
 PSYC*6750 Applications of Cognitive Science
 PSYC*6780 Foundations of Cognitive Sciences
 and two elective courses, one from each of List A and List B

LIST A:

PSYC*6810 Neuropsychology
 PSYC*6870 Human Factors
 PSYC*6770 Modelling of Mental Processes
 PSYC*7070 Psychological Measurement
 PSYC*6790 Memory and Cognition
 PSYC*6800 Learning and Physiology
 PSYC*6380 Psychological Applications of Multivariate Analysis
 PSYC*6670 Research Methods

LIST B:

CIS*6420 Artificial Neural Networks
 CIS*6020 Knowledge Representation and Expert Systems
 ENGG*6090 Special Topics in Engineering
 PHIL*6120 Philosophy of Mind
 PHIL*6220 Epistemology
 PHIL*6730 Contemporary Philosophy of Science
 and MA Thesis.

Applied Social Psychology

PSYC*6640 Foundations of Applied Social Psychology
 PSYC*6830 Applied Social Psychology
 PSYC*6590 Social and Community Intervention; OR
 PSYC*6522 Research Seminar II
 PSYC*6840 Program Evaluation; OR
 PSYC*6522 Research Seminar II
 PSYC*6880 Ethical Issues in Psychology
 PSYC*6060 Research Design and Statistics
 PSYC*6670 Research Methods
 PSYC*6471 Practicum I

and one elective course to be determined in consultation with the student's MA Advisory Committee, and MA Thesis.

Clinical Psychology: Applied Developmental Emphasis

PSYC*6060 Research Design and Statistics
 PSYC*6630 Developmental Psychology
 PSYC*6000 Developmental Psychopathology: Etiology and Assessment
 PSYC*6580 Models of Child and Adolescent Psychotherapy
 PSYC*6690 Cognitive Assessment of Children and Adolescents

PSYC*6700

Personality and Social Assessment of Children and Adolescents

PSYC*6010

Learning Disorders: Research and Clinical Practice

PSYC*6471

Practicum I

PSYC*6473

Practicum III

PSYC*6880

Ethical Issues in Psychology

and MA Thesis.

Industrial/Organizational Psychology

PSYC*7010

Personnel I: Foundations of Personal Decisions

PSYC*7030

Organizational Psychology I: Micro and Macro Influences

PSYC*6060

Research Design and Statistics

PSYC*6670

Research Methods

PSYC*7020

Personnel II: Recruitment, Selection, and Placement

PSYC*7070

Psychological Measurement

PSYC*6880

Ethical Issues in Psychology

PSYC*6380

Psychological Applications of Multivariate Analysis

PSYC*7040

Organizational Psychology II: Group and Intergroup

Processes

PSYC*6471

Practicum I

PSYC*7160

Applications of I/O Psychology

PSYC*7080

Organizational Interventions, OR

PSYC*6840

Program Evaluation

and MA Thesis.

PhD Program

Admission Requirements PhD Program

Students must have completed MA requirements in the appropriate field of study (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 MA 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 MA level courses to ensure adequate background preparation for PhD work.

Degree Requirements PhD Program

Applied Cognitive Science

PSYC*6900 Philosophy and History of Psychology as a Science;
 two seminar courses (PSYC*6402 and PSYC*6412);
 two elective courses with one chosen from List A and one from List B (see MA course lists A and B above);
 the option of taking
 PSYC*6472 Practicum II;
 Qualifying exam;
 and PhD Thesis

Applied Social Psychology

PSYC*6900 Philosophy and History of Psychology as a Science
 PSYC*6380 Psychological Applications of Multivariate Analysis
 PSYC*6522 Research Seminar II OR
 PSYC*6471 Practicum I
 PSYC*6270 Issues in Family Related Social Policy OR
 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*6670 Research Methods
 PSYC*6900 Philosophy and History of Psychology as a Science
 PSYC*6380 Psychological Applications of Multivariate Analysis
 PSYC*6472 Practicum II
 PSYC*6810 Neuropsychology
 PSYC*7070 Psychological Measurement
 PSYC*6840 Program Evaluation
 PSYC*6610 Advanced Child and Adolescent Psychotherapy
 PSYC*6890 Legislation and Professional Practice
 PSYC*6020 Clinical and Diagnostic Interviewing Skills

One of PSYC*6590 Social and Community Intervention, or PSYC*6640 Foundations of Applied Social Psychology, or PSYC*6830 Applied Social Psychology for students without 2 senior level undergraduate courses in social psychology;

Qualifying Exam;

PSYC*8000

Clinical Internship;

and PhD Thesis.

Industrial/Organizational Psychology

PSYC*7130

I/O Psychology Doctoral Research Seminar I

PSYC*6900

Philosophy and History of Psychology as a Science

PSYC*7140

I/O Psychology Doctoral Research Seminar II

one elective from

PSYC*6840 Program Evaluation OR
 PSYC*7080 Organizational Interventions OR
 PSYC*7170 I/O Doctoral Research Internship I OR
 PSYC*7180 I/O Doctoral Research Internship II
 Qualifying Exam;
 and PhD Thesis.

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.

Restriction(s): Restricted to Psychology graduate students; all others by permission only

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.

Restriction(s): For Clinical Psychology: Applied Developmental Emphasis students, registration is dependent on permission of the instructor and the successful completion (passing grade and satisfactory rating on the practical component) of PSYC*6010, PSYC*6690 and PSYC*6700.

PSYC*6472 Practicum II U [1.00]

See PSYC*6471 above. Students work four to five days a week in the selected setting.

PSYC*6473 Practicum III U [0.25]

See PSYC*6471 above. This course is intended for students who wish to gain additional practicum experience after completing the requirements for PSYC*6471/2. 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

PSYC*6900 Philosophy and History of Psychology as a Science U [0.50]

This doctoral course examines the philosophical and metatheoretical issues involved in the scientific analysis of human experience. Both the historical context of these issues and the status of current metatheoretical debates are covered.

PSYC*7070 Psychological Measurement U [0.50]

Concepts and applications of classical measurement theory, especially reliability and validity of tests and measurements used in applied psychology. Principles of test construction, standardization, norming, administration, and interpretation are discussed, as well as integration of test information and its use in decision making.

Restriction(s): Instructor's signature required

Applied Cognitive Science

PSYC*6750 Applications of Cognitive Science W [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.

Restriction(s): Restricted to Psychology graduate students; all others by permission only

PSYC*6770 Modelling Mental Processes W [0.50]

This is a course in the nature of models of cognitive phenomena, with emphasis on the evaluation of computational and connectionist models for perception, memory, cognition, and action. It involves practical work: the construction and testing of models using software designed for that purpose.

Prerequisite(s): PSYC*6780

PSYC*6780 Foundations of Cognitive Science F [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 Learning and Physiology U [0.50]

This course reviews the major theories, issues, and methodologies guiding contemporary research in learning, comparative, and physiological psychology.

PSYC*6810 Neuropsychology U [0.50]

This course focuses on current developments in neuropsychology. Particular emphasis is placed on the aphasias, apraxias, memory disorders, and disorders of movement.

PSYC*6870 Human Factors U [0.50]

This course provides an overview of contemporary theory and research in human factors/ergonomics. Topics may include visual performance, information processing, human error, decision-making, mental workload, process control and automation, attention and time sharing, human factors in specific occupational environments, monitoring and supervisory control.

Applied Social Psychology

PSYC*6270 Issues in Family-Related 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]

Discussion focuses on strategies of preventing mental illness and promoting mental health and social competence. Stressful life event theory, social support, coping, and the epidemiology of mental illness are reviewed.

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.

Prerequisite(s): PSYC*6670 Research Methods

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 Family-Related 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. In addition, issues of power relationships, cultural sensitivity and empirical support will be addressed

Prerequisite(s): PSYC*6580 and PSYC*6472. PSYC*6472 may be taken concurrently with PSYC*6610.

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. Restricted to applied developmental students. As a prerequisite for PSYC*6471, a passing grade and a satisfactory rating on the practical component must be achieved.

PSYC*6700 Personality and Social Assessment of Children and Adolescents U [0.50]

This course considers projectives, questionnaires, observations and interviews for assessing children's personality and behaviour. Students administer tests, score, interpret and write reports under supervision. Restricted to applied developmental students. As a prerequisite for PSYC*6471, a passing grade and a satisfactory rating on the practical component must be achieved.

PSYC*8000 Clinical Internship U [0.00]

A mark of satisfactory (SAT) in this course indicates that a student in the Clinical Psychology: Applied Developmental Emphasis (CP:ADE) field has successfully completed a full year (1800-2000 hour) internship in an accredited clinical setting (e.g., CPA or APA) approved by the Director of Clinical Training for CP:ADE.

Prerequisite(s): Completion of all course work in the CP:ADE field, the PhD qualifying examination, and the PhD Thesis proposal at the time of application, one year in advance of beginning the clinical internship.

Industrial/Organizational Psychology**PSYC*7010 Personnel I: Foundations of Personnel Decisions U [0.50]**

Basic personnel functions are discussed, including job analysis, job evaluation, human resource planning, and criterion development, as well as the economic and legal environment in which these activities take place.

PSYC*7020 Personnel II: Recruitment, Selection, and Placement U [0.50]

An examination of theory, research, and practice in the area of personnel selection.

PSYC*7030 Organizational Psychology I: Micro and Macro Influences U [0.50]

This course examines micro- and, to a lesser extent, macro-level influences on organizational behaviour. Topics include absenteeism, turnover, work attitudes, stress, occupational health and safety, and unionization.

PSYC*7040 Organizational Psychology II: Group and Intergroup Processes U [0.50]

This course examines theories, research, and application of group and intergroup processes within the organizational context. Topics include basic group dynamics, leadership and supervision, conflict, and industrial relations as well as gender, minority, and cross-cultural issues.

PSYC*7060 Organization Development Consulting U [0.50]

An introduction to the theories and consultation techniques for improving organizational effectiveness.

PSYC*7080 Organizational Interventions U [0.50]

This course examines various modes of organizational intervention from the standpoint of both theory and practice. Areas typically covered include training and development, organizational development and change, individual coaching, and consulting skills development.

Prerequisite(s): Registration in the graduate IO psychology program and permission of the Instructor.

PSYC*7130 Industrial/Organizational Psychology Doctoral Research Seminar I U [0.50]

This course introduces participants to a broad range of research in Industrial/Organizational psychology. It emphasizes critical examination and discussion to develop skills in theory building and programmatic research. This course is intended to prepare participants for the Industrial/Organizational Doctoral Research Seminar II and Research Internship(s).

PSYC*7140 Industrial/Organizational Psychology Doctoral Research Seminar II U [0.50]

Participants investigate a specific area of Industrial/Organizational psychology. They critically review past and current research, including theory development and empirical findings. Participants work together to integrate past theory and findings, to note inconsistencies in the literature, and to identify promising areas for future investigations.

Prerequisite(s): PSYC*7130.

PSYC*7160 Applications of Industrial/Organizational Psychology U [0.25]

This half course provides the opportunity for the integration of material covered throughout the graduate program. Students will design specific interventions that integrate technical, organizational, and ethical issues in response to various organizational problems.

PSYC*7170 Industrial/Organizational Psychology Doctoral Research Internship I U [0.50]

Participants work with an Industrial/Organizational faculty member to conduct research on a topic of mutual interest (other than their doctoral research). They collect and/or analyze data and write up results with the goal of producing a conference presentation and/or a quality publication manuscript.

Prerequisite(s): PSYC*7130

Co-requisite(s): PSYC*7140

Restriction(s): Instructor's signature required

**PSYC*7180 Industrial/Organizational Psychology Doctoral Research Internship II
U [0.50]**

Participants work with an Industrial Organizational faculty member to conduct research on a topic of mutual interest (other than their doctoral research). They collect and/or analyze data and write up results with the goal of producing a conference presentation and/or a quality publication manuscript.

Prerequisite(s): PSYC*7130, PSYC*7140, PSYC*7170.

Restriction(s): Instructor's signature required

Resource and Environmental Economics

Administrative Staff

Graduate Co-ordinator

Spencer Henson (Agricultural Economics and Business: 321 MacLachlan, Ext. 53134)
shenson@uoguelph.ca

Graduate Co-ordinator

Thanasis Stengos (715 MacKinnon, Ext. 53917)
tstengos@uoguelph.ca

Graduate Faculty

Brian S. Ferguson

BA Mount Allison, MA Guelph, PhD Australian National - Associate Professor, Economics

Glenn C. Fox

BSc (Agr), MSc Guelph, PhD Minnesota - Professor, Agricultural Economics and Business

William J. Furlong

BA Sir George Williams, PhD Queen's - Assistant Professor

Michael J. Hoy

BMath Waterloo, PhD London School of Economics - Professor, Economics

John R. Livernois

BA Toronto, MA, PhD British Columbia - Professor, Economics

Christopher J. McKenna

BSc Salford, DPhil York - Professor, Economics

Ross McKittrick

BA Queen's MA, PhD British Columbia - Associate Professor, Economics

David M. Prescott

BA Durham, MA Warwick, PhD Queen's - Professor, Economics

Asha Sadanand

BSc, MA Alberta, PhD California Institute of Technology - Professor, Economics

Clive Southey

BComm Natal, BA Capetown (South Africa), PhD British Columbia - Associate Professor, Economics

Thanasis Stengos

BSc, MSc London School of Economics, PhD Queen's - Professor, Economics

Robert Swidinsky

BComm, MA Manitoba, PhD Minnesota - Assistant Professor, Economics

Henry Thille

BComm Saskatchewan, MA, PhD British Columbia - Assistant Professor, Economics

Alfons J. Weersink

BSc Guelph, MSc Montana State, PhD Cornell - Associate Professor, Agricultural Economics and Business

PhD Program

The PhD in Resource and Environmental Economics is offered collaboratively by the Departments of Economics, and Agricultural Economics and Business. Students apply to and enroll in one of these departments and the degree is awarded in the subject area of that department.

The objective of the PhD program is to provide opportunities for advanced study in this specialized area of economics. The theoretical and practical issues that are addressed in this field demand the attention of highly trained professionals who are competent in a wide range of skills, have an understanding of the relevant economic theory, quantitative methods and institutions, and are familiar with the biological and ecological aspects of environmental and natural resource management.

Admission Requirements

Applicants to the PhD program should have a master's degree in economics or agricultural 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 or MSc program in agricultural 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 PhD requires the completion of a minimum of 12 courses (see below). Students with an MA or MSc typically will have completed some of the required courses (or their equivalents) already and, when appropriate, these may be accepted in lieu of required courses. The minimum duration for the PhD is nine semesters of full-time study (or the equivalent).

Two of the required courses satisfy the quantitative methods requirement, one satisfies an interdisciplinary requirement, and the remaining courses prepare the student for the qualifying examinations. These take place in core economic theory and in two fields of specialization. The first field is natural resource and environmental economics and the second is selected by the student from the field offerings of the two departments. The first phase of the qualifying exams covers microeconomic and macroeconomic theory and is

written at the end of the first year, normally before the beginning of classes in the fall semester. The second phase covers the fields of specialization and includes an oral defense of a thesis prospectus. This phase of the exam is taken during the seventh semester of the program. Upon satisfactory completion of the qualifying exams, the student becomes a candidate for the PhD degree. The following summarizes the program requirements:

Economic Theory

All students must satisfy the economic theory requirement by successfully completing the following four courses and by successfully completing the qualifying examination in economic theory.

ECON 6000	Microeconomic Theory I
ECON 6010	Microeconomic Theory II
ECON 6020	Macroeconomic Theory I

Resource and Environmental Economics

All students must satisfy the field requirement in natural resource and environmental economics by successfully completing the following four courses.

AGEC 6610	Economics of Renewable Resources
AGEC 6700	Advanced Resource Economics
ECON 6800	Environmental Economics
ECON 6810	Economics of Nonrenewable Resources

Economic Research Methods:

All students must satisfy the economics research methods requirement by successfully completing a minimum of the following courses:

AGEC 6100	The Methodology of Economics
ECON 6140	Econometrics I

Plus ONE of:

AGEC 6360	Mathematical Programming
ECON 6160	Econometrics II

Additional course requirements:

All students must successfully complete a further TWO graduate courses as approved by the advisory committee and Graduate Coordinator in the department in which the student is enrolled. At least one of these courses must be from among the offerings of the Departments of Economics and of Agricultural Economics and Business. Please consult the course listings for these departments in this calendar.

Thesis Proposal:

By the end of a student's fifth semester and only after the microeconomic theory comprehensive examination has been passed, they must prepare and submit a written proposal of their thesis and defend this in an oral examination.

Research Paper:

By the end of a student's sixth semester and only after the microeconomic theory comprehensive examination has been passed, they must prepare a research paper of an acceptable PhD standard under the supervision of at least one faculty member from either the Departments of Economics or of Agricultural Economics and Business.

When a student is deemed to have satisfied all of the above requirements, they will have 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.

Thesis

Submission and defense 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 judgment on the part of the candidate. Theses must be submitted within 24 months of completing the minimum duration.

Courses

Please consult the Agricultural Economics and Business and Economics listings for descriptions of the courses available to students in the shared PhD program in resource and environmental economics.

Rural Extension Studies

The Rural Extension Studies Program offers courses of study leading to the MSC degree. Faculty strengths and academic resources support the field of Capacity Development and Extension.

Administrative Staff

Chair

John FitzGibbon (103B Landscape Architecture, Ext. 56784)
jfitzgib@uoguelph.ca

Graduate Co-ordinator

James P. Mahone (142 Landscape Architecture, Ext. 56781)
jmahone@uoguelph.ca

Graduate Secretary

Nancy Orso (100 Landscape Architecture, Ext. 56780)
norso@uoguelph.ca

Graduate Faculty

Glen C. Filson

BA, MEd Saskatchewan, PhD Toronto - Associate Professor

Helen Hambly Odame

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

Jana D. Janakiram

BSc Madras, MSc Indian Agricultural Research Institute (New Delhi), PhD Western Australia - Associate Professor

Allan C. Lauzon

BA, MSc Guelph, EdD Toronto - Associate Professor

James P. Mahone

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

Craig J. Pearson

BSc Western Australia, MSc Guelph, PhD Macquarie - Dean, Ontario Agricultural College

MSc Program

Rural Extension Studies offers a professionally oriented program leading to the MSc degree in rural extension studies. 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 Agricultural Economics and Business, 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. All incoming students are expected to have completed at least one third- or fourth-year-level undergraduate statistics course. 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 School of Rural Extension Studies have employment backgrounds in areas such as agricultural extension, rural and volunteer organizations, community development, 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 the equivalent, must be completed. Thesis and major paper options are available. For the thesis option, 3.0 credits plus a research thesis are required; for the major paper option, 4.0 credits plus the Major Research Paper are required. All students must complete the core courses (described in the course list for this program).

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

All students will be required to complete a thesis or major research paper. Normally a supervised practicum or internship will be required, unless the student has substantial relevant experience.

Interdepartmental Programs

International Development Studies Collaborative Program

Rural Extension Studies participates in the collaborative international development studies (CIDS) 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.

Rural Studies PhD Program

Rural Extension Studies is a major participant in the PhD in rural studies in the field of sustainable rural communities. Included in the graduate faculty for the program are G. C. Filson, J. Janakiram, A. Lauzon (PhD Rural Studies Director), J. Mahone, H. Hambly Odame, and R. Ramirez. This PhD program provides opportunities for students to be advised by faculty in this program. PhD students will enroll in the interdepartmental Rural Studies program.

Courses

Disciplinary Core

plus Analytical Methods, RPD*6380 or EDRD*6000

REXT*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: Human Resources Development and Participatory Development.

REXT*6260 Research Methods 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.

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

Nature and use of qualitative data collection and analysis techniques by practitioners in the planning, implementation and evaluation of rural planning and development activities in both domestic and international settings.

Prerequisite(s): RPD*6170 or REXT*6260 or LARC*6610

Rural Extension Processes

REXT*6190 Fundamentals of Interpersonal and Intercultural Communication U [0.50]

The role of communication in interpersonal and intercultural relations in both formal and non-formal organizations. It specifically focuses on the theories and competencies that are required for communication between individuals and those within and between different cultures.

REXT*6311 Extension Theory and Methods U [0.50]

Theories, principles and practices associated with effective instruction in extension are taught. Emphasis is given to non-formal teaching-learning situations; importance of socio-economic and cultural environment; communication skills using creative and appropriate technology in the transfer of information.

REXT*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.

REXT*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. Visits to community-facilitated meetings will be part of the course.

Communication Technology

REXT*6420 Development Communication U [0.50]

Form of community development that utilizes communication technology in a participatory format with a political commitment to democracy and equity. Students introduced to range of technologies that are utilized in development communication (radio, video, Internet, etc.) and principles of development communication.

Other (May be applicable in either or both of the above fields)

REXT*6060 Adult Learning and Development U [0.50]

Adult development through life stages; profile of adult learners; learning abilities and difficulties; learning theory as applied to adults; sociological contexts for adult learning; participation levels and barriers to participation. Various perspectives on adult learning (modernist to postmodern).

REXT*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.

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

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

REXT*6690 Decision Making and Conflict U [0.50]

A systemic, comparative and interdisciplinary perspective, the linkage between decision processes, and conflict, both at the micro (community and interpersonal) level and at the broader macro level of structural change and globalization. Examines the theory and practice of socio-economic, cultural and political conflict in social systems and the modalities for its resolution from an interdisciplinary standpoint.

REXT*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.

Rural Planning and Development

Rural Planning and Development has a four-part mission of teaching, research, training and outreach.

Administrative Staff

Director

John FitzGibbon (103B Landscape Architecture, Ext. 56784)
jfitzgib@uoguelph.ca

Graduate Co-ordinator

Harry Cummings (102B Landscape Architecture, Ext. 53637)
hcummings@uoguelph.ca

Graduate Secretary

Nancy Orso (100 Landscape Architecture, Ext. 56780)
norso@uoguelph.ca

Graduate Faculty

Farokh Afshar

AA Dipl Arch. Assoc. London, PhD M.I.T. - Associate Professor

Wayne J. Caldwell

BA, MA Western Ontario, PhD Waterloo - Professor

F. Harry Cummings

BA Western Ontario, MA, PhD Clark - Professor

David J.A. Douglas

BA National Univ. of Ireland, MA Toronto - Professor

John E. FitzGibbon

BA McMaster, MSc Wales, PhD McGill - Professor

John FitzSimons

BA Wales, MA McMaster, PhD Western Ontario - Associate Professor

Anthony M. Fuller

BA, PhD Hull - Professor

Stewart G. Hilts

BA Western Ontario, MA, PhD Toronto - Professor

Donald G. Reid

BA Wilfrid Laurier, MA, PhD Waterloo - 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 either Canadian or international (developing areas) contexts. The program leads to an MSc (Planning) degree. It is a professionally oriented program that requires substantial commitment to professional performance and ethics.

Graduate students in Rural Planning and Development find employment in rural planning departments and with non-governmental organizations in Canada and in rural development agencies overseas. Graduates are prepared for both local development and planning as well as national-level research and policy planning.

The program objective 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.

Students interested in a rural planning and development program are registered in the school, although in keeping with the school's interdisciplinary philosophy they are encouraged to take courses and work with faculty in other units on campus. 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 a wide variety of 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. Students choose a general area of emphasis from: 1) community planning and development, 2) municipal land use planning, and 3) resource management planning.

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. These consist of the school core of three courses: 1) Planning and Development Theory, 2) Rural Research Methods - Foundations, and 3) Application of Quantitative Techniques in Rural Planning

and Development, and the Canadian planning and development core consisting of three courses: 1) Rural Planning Methods, 2) Rural Public Administration, and 3) Rural Planning Synthesis.

In addition, students are required to complete a minimum of either four courses, a thesis and an internship; or six courses, a major research paper and an internship.

The area of emphasis is developed by the students and their advisory committees through course work, selection of elective courses, the internship, and student research leading to the major research paper or thesis.

In the delivery of the Canadian rural planning and development field, the school 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 six faculty in the school are Registered Professional Planners.

MSc (Planning) in Rural Development Planning (International)

This field prepares students for research and practice in rural development planning in the international context. 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. Four areas of emphasis are offered: 1) settlement and area development planning, 2) natural resources development planning, 3) human resources and social services development planning, and 4) program and project development planning.

All students enrolled in this field are required to complete a set of core courses that provide a foundation for international rural development planning research and practice. These consist of the school core of three courses: 1) Planning and Development Theory, 2) Rural Research Methods - Foundations, and 3) Application of Quantitative Techniques in Rural Planning and Development, and the international development planning core of two courses: 1) International Rural Development Planning: Principles and Practices and 2) Synthesis: Seminar in Integrated Rural Development Planning.

In addition, students are required to complete a minimum of either three courses and a thesis, or five courses and a major research paper.

The area of emphasis is developed by students and 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.

In the delivery of the international rural development planning field, the school draws on courses and faculty from other units on campus as well as on the resources of the school.

Graduate Diploma Program

Graduate Diploma in International Rural Development Planning

The objective of the graduate diploma program is to provide mid-career, rural development professionals from Canada and abroad with postgraduate education and training to improve their job-related expertise within a 10 month practitioner-oriented program. The program enhances the ability of such persons to be effective in the conceptualization, design, planning, implementation, management and evaluation of rural development policies, programs and projects internationally.

Admission Requirements

Applicants require a Canadian 3 year Bachelor's degree (or equivalent) with a satisfactory academic record. At least five years of responsible professional experience in rural development or a related field is also required.

Diploma Requirements

The 10 month program from September to June 30 combines graduate course work with field studies and a professional paper. The program requires at least 2.75 course credits, including the course, International Rural Development Planning: Principles and Practices, the Major Professional Paper, and Diploma Field Studies. In addition, at least three other courses must be taken during the 10 months. Of these three courses, two can be from a department/school other than Rural Planning and Development. See also the Graduate Diploma in International Rural Development Planning in the degree regulations.

Interdepartmental Programs

Rural Studies PhD Program

Rural Planning and Development participates in the PhD program in rural studies in the field of sustainable rural communities. Those 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

Required Core

RPD*6170 Philosophy and Methods in Rural Planning and Development Research U [0.50]

The course provides rural planning and development professionals with a number of theoretical frameworks and practical approaches to problem solving in rural Canadian and international contexts. The course content provides an introduction to hypothesis development, data collection, analytical frameworks, research management, and information synthesis and presentation methodologies that are appropriate to the practicing rural planner and developer. It views the roles of the researcher and research as interventionist and intervention in the rural community. Research methods are discussed as an integral and supporting part of the planning and development process.

RPD*6240 Planning and Development Theory U [0.50]

Examines basic concepts, theories and perspectives in rural planning and development. A conceptual examination of 'rural', 'planning' and 'development' precedes an examination of how rural planning and development is viewed from alternative, often conflicting theories of rural change and planned intervention. The implications for practice are discussed.

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

Analysis and application of standard quantitative, statistical and computer-based techniques utilized in rural planning and development. Problems of data collection, analysis and interpretation.

Required Canadian Planning and Development Core

RPD*6250 Public Administration in Rural Communities U [0.50]

An introduction to the nature and problems of government and administration in the small municipality (less than 25,000). Major topics include: municipal law, capital budget and implementation, public services and infrastructure, personnel management.

RPD*6280 Rural Planning Methods U [0.50]

Basics of rural planning practice, including communications, graphics, group dynamics, interviews and community surveys, questionnaire design and non-parametric statistics and role of citizen participation.

RPD*6300 Rural Planning Synthesis U [0.50]

The application of planning techniques and methodologies to various kinds of rural planning problems. Students prepare and present specific solutions to a practical problem in rural planning.

Required International Rural Development Planning Core

RPD*6030 International Rural development Planning: Principles and Practices U [0.50]

This course presents the scope and nature of international development planning and alternative roles for development planners; has a rural emphasis; reviews the evolution of development planning from macroeconomic beginnings to more integrated local planning approaches; examines the development planning process and its organizational and spatial dimensions; compares policy, program, project, sectoral and integrated area planning; and compares rural development planning in market, mixed and state-driven societies.

RPD*6400 Synthesis: Seminar in Integrated Rural Development Planning U [0.50]

Field conditions for an integrated rural development project are simulated. Students work in multidisciplinary teams to plan, implement and evaluate the project. The Sulawesi Regional Development Project (Indonesia) is used (with other projects, as appropriate) as the case study.

Required Diploma Core

RPD*6030 International Rural development Planning: Principles and Practices U [0.50]

This course presents the scope and nature of international development planning and alternative roles for development planners; has a rural emphasis; reviews the evolution of development planning from macroeconomic beginnings to more integrated local planning approaches; examines the development planning process and its organizational and spatial dimensions; compares policy, program, project, sectoral and integrated area planning; and compares rural development planning in market, mixed and state-driven societies.

RPD*6850 Graduate Diploma Field Studies S [0.25]

Students participate in a number of field experiences within the program. These experiences include study tours of rural regions, meetings with leading professional Canadian counterparts in counterpart rural organizations; study-visits to rural farms and industries; farm-stays and internships; and participation in professional and scholarly conferences. They write a report on the above, examining the lessons learned and their applicability (or lack of) to their own work context.

RPD*6900 Graduate Diploma Major Professional Paper S [0.50]

The paper will focus on the major interest area of the student, likely one he/she will return to practice in after graduation. It includes a review of the international literature and experience on the topic and compares this with the personal experience of the student and his/her organization and work context. Where appropriate, for example, when the student is returning to a specific organization, the student is encouraged to develop in the paper a work plan examining how to apply what is proposed in the paper and/or what was learned in the program to the work context the student is returning to.

Elective Courses

Below are the commonly used courses for electives, including some of those encompassing the social, economic, biophysical, political/institutional and legal perspectives in the program.

RPD*6020 Rural Community Systems U [0.50]

This course familiarizes students with the particular characteristics of local rural community systems in Canada and how these vary over space and time. Emphasis is placed on defining rurality, the measurement of rural systems and on recognizing and dealing with informal elements in the rural community. A special section deals with preparing, as a professional, for work in such conditions. Credit may not be obtained for both GEOG*6270 and RPD*6020.

RPD*6040 Settlement Systems and Area Development Planning: Policies and Procedures U [0.50]

This course examines the issues, policies and procedures in settlement and area development. The focus is on lagging subnational rural areas in the international context. It discusses the determinants of settlement and area development and policies and strategies adopted to accelerate development. It presents procedures and selected techniques to develop such settlements and areas.

RPD*6060 Settlement, Housing, and Services: Planning and Management U [0.50]

This course provides an understanding of the issues, policies, and strategies in planning and managing a settlement. It teaches procedures and selected techniques. Topics include financing and managing the settlement, employment and the construction sector, land use, housing and services. The emphasis is on the international and rural context.

RPD*6070 Project Development: Principles, Procedures, and Selected Methods U [0.50]

This course introduces students to the principles, procedures and methods in developing a project. It examines the project cycle: identification, preparation, appraisal, implementation/supervision, monitoring and evaluation. It gives an understanding of the major methods involved and teaches selected methods. The focus is on the international, rural context and on small non-farm projects: small industries, small physical infrastructure and social projects.

RPD*6080 Environment and Development: Biophysical Resources and Sustainable Development in Rural Environments U [0.50]

This course will examine the problems and potential for ecologically sustainable development in the context of rural development planning particularly in the Third World environments. The course critically examines the strategic planning approaches and methods which involve the interaction between social systems and natural ecosystems in the context of planned intervention and change in rural environments.

RPD*6220 Rural Resources Policy U [0.50]

Contemporary resource use and environmental policy decisions at various scales; historical development of policy decisions; sociological, ecological and ethical considerations; evaluation of present and emerging policies.

RPD*6260 Land Use Planning Law U [0.50]

An introduction to the legal tools used to regulate the use of land and other resources. Zoning, subdivision controls, development control, land banking, expropriation, planning appeals, official maps, etc. An intensive study of the Ontario Planning Act and related legislation.

RPD*6290 Special Topics in Rural Planning and Development U [0.50]

Selected study topics focus on the nature of rural planning and development issues and/or practices in Canadian and/or International small communities and rural environments. Among the topics which may be addressed are: rural land use planning, ecological restoration, gender analysis in development planning, GIS in agricultural development and natural resource management, agropastoral systems, and agro-ecosystem health.

RPD*6310 Environmental Impact Assessment U [0.50]

This course deals with the role of environmental impact assessments and statements in the planning, development and operation of resource projects. Topics discussed include the philosophical and institutional basis for environmental impact assessments, methods used and the effects of such assessments on resource development projects.

RPD*6320 Water Resource Management U [0.50]

The course provides an assessment of the processes and principles which underlie comprehensive water resource planning and integrated basin management. It also undertakes to evaluate current practice in the context of integrated planning. There is extensive use of Canadian and international practice.

RPD*6350 Northern and Native Development and Planning U [0.50]

A critical analysis of development and planning in Northern Canada, including examination of policies and implementation strategies of governments and private enterprise; their impacts upon northern and native communities; and consideration of proactive locally based planning for community development.

RPD*6360 Major Research Paper U [1.00]

Students not pursuing the coursework/thesis route must satisfactorily complete a major research paper. Preparation of 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 in a theoretical context, and an analysis of the problem using appropriate methodological and analytical procedures. This will normally be equivalent to a two-semester course.

RPD*6370 Economic Development Planning and Management for Rural Communities U [0.50]

Theories and perspectives of local economic development, particularly community-based planning for rural economic development. Economic development within a community development framework, and challenges of sustainable development. Interdisciplinary perspectives and alternative approaches to professional planning practice, strategic planning, management and organizational design/development issues. Alternative economic concepts and perspectives are critically examined. Includes international case studies.

RPD*6390 Rural Social Planning U [0.50]

This course will provide students who have an interest in social development with an avenue for linking that interest to the policy, planning and intervention process.

RPD*6410 Readings in Rural Planning U [0.50]

A program of supervised independent study related to the student's area of concentration. Nature and content of the readings course are agreed upon between the student and the instructor, and are subject to the approval of the student's advisory committee and graduate committee.

RPD*6450 Recreation and Tourism Planning and Development U [0.50]

This course is intended to instruct the student in the principles of planning for recreation and tourism development. Emphasis is placed on the economic and social benefits and costs that accrue from tourism and recreation development. Planning principles are applied to this context.

Agricultural Economics and Business**AGEC*6600 Agriculture in Economic Development F [0.50]**

The course is concerned with the role of agriculture as a source of food, fibre and employment in developing countries. The interaction between agriculture and other sectors of the economy and other countries is also examined.

Prerequisite(s): ECON*1050 and ECON*1100

AGEC*6630 Regional Economic Models U [0.50]

Theories and research in regional economics stressing regional development, socio-economic accounting, analysis of structure and growth, economic base and multiplier models.

AGEC*6690 Program Evaluation U [0.50]

An advanced seminar dealing with the theory and practice of program evaluation focusing on public sector programs in agriculture and rural development, international and domestic case studies.

Environmental Design and Rural Development**EDRD*6000 Qualitative Analysis in Rural Development U [0.50]**

Nature and use of qualitative data collection and analysis techniques by practitioners in the planning, implementation and evaluation of rural planning and development activities in both domestic and international settings.

Prerequisite(s): RPD*6170 or REXT*6260 or LARC*6610

Geography**GEOT*6281 Environmental Resource Evaluation F [0.50]**

Analysis, evaluation and management of environmental resources. Emphasis is on biophysical and socio-economic concepts and methods which offer a more comprehensive and integrative basis for environmental decisions.

Landscape Architecture**LARC*6430 Landscape Resource Analysis F [0.50]**

Integrated field and classroom instruction introduces the student to inventory and analysis of biological, physical, social and cultural elements of the landscape. Projects will incorporate principles of landscape ecology and landscape planning. Field study will require some travel at student's expense.

LARC*6470 Integrative Environmental Planning W [0.50]

Landscape planning emphasizing the integration and interrelationships between biophysical and cultural resources, with application at a regional landscape planning scale. This course typically incorporates community-outreach projects and develops student facilitation abilities.

Rural Extension Studies**REXT*6190 Fundamentals of Interpersonal and Intercultural Communication U [0.50]**

The role of communication in interpersonal and intercultural relations in both formal and non-formal organizations. It specifically focuses on the theories and competencies that are required for communication between individuals and those within and between different cultures.

REXT*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.

Sociology and Anthropology**SOC*6420 Development, Community and Rurality U [0.50]**

This course will examine issues in different theories and models to explain rural and community change and persistence within a globalized system. While the emphasis will be on local continuity and change from a sociological and/or anthropological perspective, this will be discussed within a framework of international political economy. Case studies will be selected to illustrate different modes of change and resistance from different contexts. In particular, the role of community-led and participatory forms of development, social organization, social capital, land tenure, gender, agro-food systems, subsistence and commodification, governance, land use and environment management will be amongst topics considered. Students will be encouraged to focus their research on some of these issues in a geographical region of interest to them.

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.

Rural Studies

Administrative Staff

Director and Graduate Co-ordinator

Marta Rohatynskyj (647 MacKinnon, Ext. 53554)
mrohatyn@uoguelph.ca

PhD in Rural Studies Secretary

Ornella McCarron (109 Landscape Architecture, Ext. 58901)
omccarro@uoguelph.ca

Graduate Faculty

Farokh Afshar

Professor, SEDRD

J.I. (Hans) Bakker

Associate Professor, Sociology and Anthropology

Robert D. Brown

Professor, SEDRD

Wayne Caldwell

Associate Professor, SEDRD

Robert Corry

Assistant Professor, SEDRD

John Cranfield

Assistant Professor, Agricultural Economics and Business

Terry A. Crowley

Professor, History

F. Harry Cummings

Professor, SEDRD

David J.A. Douglas

Professor, SEDRD

Fred Eidlin

Professor, Political Science

Glen C. Filson

Associate Professor, SEDRD

John FitzGibbon

Professor, SEDRD

Anthony M. Fuller

Professor, SEDRD

Helen Hambly-Odame

Assistant Professor, SEDRD

Spencer Henson

Professor, Agricultural Economics and Business

Stewart G. Hilts

Professor, Land Resource Science

Sally Humphries

Associate Professor, Sociology and Anthropology

Jana D. Janakiram

Associate Professor, SEDRD

Craig Johnson

Associate Professor, Political Science

Alun E. Joseph

Professor, Geography

Reid D. Kreutzwiser

Professor, Geography

Richard G. Kuhn

Associate Professor, Geography

Karen Landman

Assistant Professor, SEDRD

Allan C. Lauzon

Associate Professor, SEDRD

Belinda Leach

Associate Professor, Sociology and Anthropology

Jim Mahone

Associate Professor, SEDRD

Jorge Nef

Professor, SEDRD

Cecelia Paine

Associate Professor, SEDRD

Nathan H. Perkins

Associate Professor, SEDRD

Wayne C. Pfeiffer

Associate Professor, Agricultural Economics and Business

Nancy Pollock-Ellwand

Associate Professor, SEDRD

Donald G. Reid

Professor, SEDRD

Marta Rohatynskyj

Associate Professor, Sociology and Anthropology

Saba Safdar

Assistant Professor, Psychology

Rakhel Sarker

Assistant Professor, Agricultural Economics and Business

Frans J. Schryer

Professor, Sociology and Anthropology

Barry Smit

Professor, Geography

John A. Smithers

Associate Professor, Geography

Terisa Turner

Associate Professor, Sociology and Anthropology

David Waltner-Toews

Professor, Population Medicine

Alfons J. Weersink

Professor, Agricultural Economics and Business

Anthony R. Winson

Professor, Sociology and Anthropology

Ken Woodside

Professor, Political Science

Nonita T. Yap

Professor, SEDRD

PhD Program

The PhD in Rural Studies is an interdisciplinary program drawing faculty from primarily five departments/schools in two colleges. The departments/schools involved include: Agricultural Economics and Business, Environmental Design and Rural Development (Landscape Architecture, Rural Extension Studies, Rural Planning and Development), Geography, Political Science, and Sociology and Anthropology. The Program also has associated faculty from other units in the university.

The objective of the rural studies PhD program is to prepare specialists who will take leading roles in dealing with problems and opportunities in rural communities. Graduates will be expected to be highly proficient in some specific aspects of the many associated with the subject; to be able to integrate their area of emphasis with other aspects of the social, economic and biophysical scope of rural studies; and to be able to participate effectively in team efforts. Graduates will be prepared to carry out their roles through original research, integration of knowledge, teaching and other forms of education, and by providing services to members of the community.

The program focuses on a single field, sustainable rural communities. Sustainable rural communities are characterized by long-term well-being based on the integration of economic, social and environmental factors in their planning and activities. Four sectors have been designated: environment and sustainability, social structure and processes, human resource development, and sustainable rural economic development. Each represents an area of emphasis, not a specialization or discipline. A number of different disciplines are represented in each sector and in each an interdisciplinary approach is taken. Students will choose one sector for relatively more intensive study.

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, environmental science, rural extension studies 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 director 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 Graduate Program Services. Applicants should consult the program 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. It is 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 Communities, 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 is used to determine 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.

It evaluates the student's ability to integrate knowledge in the field of sustainable rural communities and the student's particular sector within the field. The qualifying examination has both written and oral components. The written component is based on the common core area of the field and the student's selected sector. The oral examination is devoted to discussion of the written materials. It evaluates the student's ability to integrate disciplinary knowledge within the field and to undertake interdisciplinary research. The qualifying examination must be completed by the end of semester five.

Courses

Common Core Courses

RST*6000 Sustainable Rural Communities F-W [1.00]
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Sustainable development theory in the rural communities and environment context.
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RST*6100 Integrative Research Methods F-W [1.00]

Research design and evaluation with a focus on measures of sustainability and on interdisciplinary applications.
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RST*6300 Research Seminar U [0.25]

Sector Core Courses

RST*6500 Special Topics U [0.50]

Sociology and Anthropology

The Department of Sociology and Anthropology offers a graduate program leading to an MA degree in the fields of sociology and cultural anthropology. The program offers both a research-based thesis option and a course work and major paper option.

Administrative Staff

Chair

Frans Schryer (625 MacKinnon, Ext. 56527)
fschryer@uoguelph.ca

Graduate Co-ordinator

Tony Winson (617 MacKinnon, Ext. 52193)
twinson@uoguelph.ca

Graduate Secretary

Millie MacQueen (623 MacKinnon, Ext. 53895)
mmacquee@uoguelph.ca

Graduate Faculty

J.I. (Hans) Bakker

BA South Alabama, MA Colorado State, PhD Toronto - Associate Professor

Myrna Dawson

BA York, MA, PhD Toronto - Assistant Professor

Frederick T. Evers

BS Cornell, MS, PhD Iowa State - Professor

Cecil A. Foster

BA, MA, PhD York - Assistant Professor

Linda M. Gerber

BScN, MA, PhD Toronto - Associate Professor

Edward J. Hedican

BA Lakehead, MA McMaster, PhD McGill - Associate 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 - Assistant Professor

Lisa Kowalchuk

BA McMaster, MA McGill, PhD York - Assistant Professor

Belinda Leach

BA Carleton, MA, PhD Toronto - Associate Professor

Madonna R. Maidment

BA, MA Memorial, PhD Carleton - Assistant Professor

Kenneth S. Menzies

BA Queen's, MSc London, PhD Essex - Professor

William O'Grady

BA, MA Carleton, PhD Toronto - Associate Professor

Patrick Parnaby

BA, MA Queen's, PhD McMaster - Assistant Professor

Kerry L. Preibisch

BA, MA Simon Fraser, PhD Reading - Assistant Professor

Marta Rohatynskyj

AB Wayne State, BA Carleton, MA, PhD Toronto - Associate Professor

Frans J. Schryer

BA Toronto, MA, PhD McGill - Professor and Chair

Vivian Shalla

BA Laurentian, MSc Montreal, PhD Carleton - Associate Professor

Jane Sprott

BA Waterloo, MA, PhD Toronto - Associate Professor

R. 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

Anthony R. Winson

BA Western, MA, PhD Toronto - 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:

- Rural, community and development studies

- Work and change in global context
- Criminology and criminal justice
- Gender, diversity and social equality

Rural Community and Development Studies

This area includes rural sociology and rural development (Canada and international), women and gender relations in development, anthropology of development, sociology of agriculture and of the rural community, community development, political economy of rural agricultural systems and the like, agro-food systems, environment, subsistence and commodification.

Work and Change in 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, criminological theory, critical criminology, street youth, young offenders, gender and offending, and criminal justice theory.

Gender, Diversity and Social Equality

This area includes gender and women's studies, Aboriginal studies, indigenous peoples, native studies, class, stratification, citizenship, power, race, minorities, ethnicity, social movements, hermeneutics, and religion.

Application Procedure

Graduate students are admitted each fall semester (approximately 15 students). The deadline for application is February 1 each year. The application fee is currently \$75 in the form of a certified cheque or money order. Information required is as follows:

- Application form or the PDF file from the on-line procedure
- One page statement of interest
- All official transcripts
- Two letters of reference with assessment forms (part of application form)

You may apply in one of three ways:

- On-line -- we encourage you to use this method
- Download an application form
- Submit a request for an application package

www.uoguelph.ca/GraduateStudies/admission.htm

NOTE: This is a self-administered application process. Please have all materials (reference letters, transcripts, application form, letter of intent) returned to you and you put everything in one envelope and send to the Department of Sociology and Anthropology Graduate Program Secretary.

Admission Requirements

Applicants must possess an Honours BA (4 years) degree or its equivalent with at least a second-class standing or 'B-' average in the final two undergraduate years. Generally, those admitted have a much higher average. 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 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 normally fulfilled through the successful completion of the courses SOC*6070 and SOC*6130 in the winter semester.

Students typically begin their studies in the fall semester. You will be assigned an interim advisor who is a likely candidate to be your advisor, given your stated area of interest. 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, your interim advisor will fill out your evaluation reports. It is strongly recommended, that you choose your permanent advisor by the end of the first semester and the rest of your committee by the middle of the second semester.

In their first fall semester, all students are required to pass the Pro-Seminar (ANTH*6700 or SOC*6700), a course graded on a satisfactory/unsatisfactory basis which is intended to introduce students to the department, the university, and the professions of sociology and anthropology.

Interdepartmental Program

Rural Studies PhD Program

The Department of Sociology and Anthropology is a major participant in the PhD program in rural studies in the field of sustainable rural communities. Included in the graduate faculty for this program are J.I. Bakker, S. Humphries, B. Leach, L. McDonald, M.

Rohatynskyj, F.J. Schryer, T. Turner and A.R. Winson. This program will provide opportunities for students to be advised by these departmental faculty. PhD students will enroll in the interdepartmental rural studies program; those with advisors in the Department of Sociology and Anthropology will have access to some departmental facilities. Please consult the Rural Studies listing for a detailed description.

International Development Studies Collaborative MA Program

The Department of Sociology and Anthropology participates in the MA program in collaborative international development studies (CIDS). Students in this option register in both the department and CIDS. Those faculty members whose research and teaching expertise includes aspects of international development studies may serve as advisors for MA students. Please consult the International Development Studies listing for a detailed description of the MA collaborative program and the special additional requirements for each of the participating departments.

Courses

NOTE: Courses in this department are designated as anthropology (prefix ANTH*-), sociology (prefix SOC*-) or either anthropology or sociology (ANTH*- or SOC*-).

Research in Social Anthropology

The Department welcomes applications from students with a background in anthropology and offer several anthropology courses at the graduate level. The anthropologists in the Department, all specializing in social or cultural anthropology are involved in teaching graduate courses and supervising graduate students. A student interested in doing research in social anthropology will have an opportunity to do so.

Core courses

ANTH*6700 Pro-seminar F-W [0.00]

The pro-seminar concerns matters involved in graduate studies and later work as a professional sociologist or anthropologist, including how to form a graduate advisory committee, assistantship responsibilities, presentation skills, exploration of careers in sociology and anthropology, writing grant proposals, reports and articles, and teaching. In the first semester students will begin to prepare research proposals for theses and major papers.

SOC*6700 Pro-seminar F-W [0.00]

The pro-seminar concerns matters involved in graduate studies and later work as a professional sociologist or anthropologist, including how to form a graduate advisory committee, assistantship responsibilities, presentation skills, exploration of careers in sociology and anthropology, writing grant proposals, reports and articles, and teaching. In the first semester students will begin to prepare research proposals for theses and major papers.

ANTH*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*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*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*6130 Quantitative Research Methods W [0.50]

The application of multiple regression to data generated by nonexperimental 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.

ANTH*6080 Anthropological Theory F [0.50]

An examination of classical and contemporary anthropological theory, including an emphasis on the most recent directions in the discipline.

Rural, Community and Development Studies

ANTH*6420 Development, Community and Rurality U [0.50]

This course will examine issues in different theories and models to explain rural and community change and persistence within a globalized system. While the emphasis will be on local continuity and change from a sociological and/or anthropological perspective, this will be discussed within a framework of international political economy. Case studies will be selected to illustrate different modes of change and resistance from different contexts. In particular, the role of community-led and participatory forms of development, social organization, social capital, land tenure, gender, agro-food systems, subsistence and commodification, governance, land use and environment management will be amongst topics considered. Students will be encouraged to focus their research on some of these issues in a geographical region of interest to them.

SOC*6420 Development, Community and Rurality U [0.50]

This course will examine issues in different theories and models to explain rural and community change and persistence within a globalized system. While the emphasis will be on local continuity and change from a sociological and/or anthropological perspective, this will be discussed within a framework of international political economy. Case studies will be selected to illustrate different modes of change and resistance from different contexts. In particular, the role of community-led and participatory forms of development, social organization, social capital, land tenure, gender, agro-food systems, subsistence and commodification, governance, land use and environment management will be amongst topics considered. Students will be encouraged to focus their research on some of these issues in a geographical region of interest to them.

Work and Change in Global Context

ANTH*6480 Work 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 global economic change. Using case studies of particular work worlds, the course may include topics such as changing patterns of work in comparative contexts; labour discipline, organizations and protest; industrial and organizational change; education for work; economic restructuring and reconfigurations of gender, race and class within and beyond the shop floor.

SOC*6480 Work 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 global economic change. Using case studies of particular work worlds, the course may include topics such as changing patterns of work in comparative contexts; labour discipline, organizations and protest; industrial and organizational change; education for work; economic restructuring and reconfigurations of gender, race and class within and beyond the shop floor.

Criminology and Criminal Justice

SOC*6350 Society, Crime and Control U [0.50]

This seminar course surveys classical theoretical perspectives and more recent theoretical developments in the sociology of crime. It will examine the assumptions and logical structure of each perspective and justifications of particular criminal justice/public policy responses. The course will also critical assess recent empirical research relevant to each perspective.

Gender, Diversity and Social Equality

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.

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.

Other**ANTH*6460 Gender and Development F [0.50]**

Cross-cultural and historical changes in gender relations and the roles/positions of women brought about by industrialization and the development of the world system. Critical examination of the predominant theories of gender relations, in so far as these inform development research and action in societies with different socio-economic systems. Introduction to the latest theories and research in the area of women and development, as well as with social and political actions undertaken by women themselves. This is one of the two alternative core courses for the Collaborative International Development Studies program.

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.

ANTH*6550 Selected Topics in Theory and Research U [0.50]

This course will be offered with varying content focusing on theory or research.

SOC*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.

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.

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.

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.

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, Environmental Biology, Human Health and Nutritional Sciences, Integrative Biology, Land Resource Science, Mathematics and Statistics, Molecular and Cellular Biology, Pathobiology, and Plant Agriculture (Horticulture division).

Administrative Staff

Director of Toxicology Program

Herman J. Boermans (2602 OVC, Ext. 54984)

hboerman@uoguelph.ca

Secretary

Beth Baker (2603 OVC, Ext. 52644)

Graduate Faculty

Herman J. Boermans

Associate Professor, Biomedical Sciences

Manfred Brauer

Associate Professor, Molecular and Cellular Biology

Nigel J. Bunce

Professor, Chemistry

Lesley J. Evans

Professor, Land Resource Science

Beverley Hale

Associate Professor, Land Resource Science

Christopher J. Hall

Professor, Environmental Biology

M. Anthony Hayes

Professor, Pathobiology

John J. Hubert

Professor, Mathematics and Statistics

P. David Josephy

Professor, Molecular and Cellular Biology

Bettina E. Kalisch

Associate Professor, Biomedical Sciences

Niel A. Karrow

Assistant Professor, Animal and Poultry Science

Peter G. Kevan

Professor, Environmental Biology

Gordon M. Kirby

Assistant Professor, Biomedical Sciences

James B. Kirkland

Assistant Professor, Human Health and Nutritional Sciences

Hung Lee

Professor, Environmental Biology

Francesco Leri

Assistant Professor, Psychology

Richard A. Manderville

Associate Professor, Chemistry

Joanne M. O'Meara

Assistant Professor, Physics

Leonard Ritter

Professor, Environmental Biology

Cynthia Scott-Dupree

Associate Professor, Environmental Biology

Frances J. Sharom

Professor, Molecular and Cellular Biology

Paul K. Sibley

Assistant Professor, Environmental Biology

Trevor K. Smith

Professor, Animal and Poultry Science

Keith R. Solomon

Professor, Environmental Biology

E. James Squires

Professor, Animal and Poultry Science

Jack T. Trevors

Professor, Environmental Biology

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 1.5 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 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.

TOX*6530 Ecotoxicological Risk Characterization W [0.50]

A biologically based advanced course that will give students working knowledge of current procedures and techniques for ecotoxicological risk characterization. The course material will cover the topics: problem definition, dose response characterization, exposure characterization, and risk assessment and risk-management decision making. (Credit may be obtained for only one of TOX6530, ENVB6530 and TOX4550.) Department of Environmental Biology

ENVB*6530 Ecotoxicological Risk Characterization W [0.50]

A biologically based advanced course that will give students working knowledge of current procedures and techniques for ecotoxicological risk characterization. The course material will cover the topics: problem definition, dose response characterization, exposure characterization, and risk assessment and risk-management decision making. (Credit may be obtained for only one of TOX6530, ENVB6530 and TOX4550.) Department of Environmental Biology

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 TOX4590 and 9406590.) Department of Chemistry and Biochemistry

CHEM*7310 Selected Topics in Biochemistry I 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*7320 Selected Topics in Biochemistry II 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*7330 Selected Topics in Biochemistry III 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*7600 Selected Topics in Organic Chemistry I 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*7610 Selected Topics in Organic Chemistry II 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*7620 Selected Topics in Organic Chemistry III 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*7630 Selected Topics in Organic Chemistry IV 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
ENVB*6180 Physiology and Biochemistry of Herbicides W [0.50]
Chemical and biological fate of herbicides in soil. Physical, morphological and physiological factors influencing herbicidal selectivity and modes of action. (Offered in alternate years.) Department of Environmental Biology
BIOM*6440 Biomedical Toxicology U [0.50]
The course examines chemical compounds injurious to animals and man, toxicity testing, teratogens, carcinogens, factors influencing toxicity, and toxic drug interactions. The mechanism of action, metabolism, and principles of antidotal treatment are also studied.
BIOM*6480 Pharmacodynamics and Pharmacokinetics U [0.50]
This course describes drug absorption, distribution, biotransformation and elimination in animals and human beings, and emphasizes factors which modify drug behaviour. It integrates molecular mechanisms with physiological processes and highlights the importance of receptors and second messengers in cellular responses to pharmacologic agents.
BIOM*6721 Special Topics in Pharmacology-Toxicology U [0.25]
This course will comprise a combination of an experimental procedure (or project), seminars, selected reading or a literature review outside the thesis subject, developed based on the student's requirements. Topics could include clinical pharmacology/toxicology, pharmaco-epidemiology/economics, gerontological or perinatal pharmacology and toxicokinetics. Department of Biomedical Sciences
BIOM*6722 Special Topics in Biomedical Pharmacology-Toxicology U [0.50]
See BIOM*6721 above.

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

Chair

Robert Jacobs (2151 OVC, Ext. 54667)
rjacobs@ovc.uoguelph.ca

Graduate Secretary

Barbara Gaudette (2653 OVC, Ext. 54406)
bgaudett@ovc.uoguelph.ca

Program Committee

Scott A. McEwen

Professor, Population Medicine

Michael R. O'Grady

Associate Professor, Clinical Studies

John F. Prescott

Professor, Pathobiology

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 2.5 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.

Zoology

The Zoology Graduate Program offers MSc and PhD degrees. Three major areas of emphasis and the faculty associated with those areas are:

- **Ecology and Behaviour** -- Ackerman, Brooks, Fryzell, McCann, McLaughlin, Noakes, Nudds, Robinson, Thomas
- **Evolutionary Biology** -- Bogart, Boulding, Crease, Danzmann, Ferguson, Fu, Hebert, Lynn
- **Physiology** -- Ballantyne, Bernier, McDonald, Van Der Kraak, Wright

Interdepartmental programs are available for students wishing to specialize in toxicology, biophysics and aquaculture.

Administrative Staff

Chair

Moira M. Ferguson (359 Axelrod, Ext. 53598/52726)
mmfergus@uoguelph.ca

Graduate Co-ordinator

Denis H. Lynn (271 Axelrod, Ext. 52746/52975)
ddr@uoguelph.ca

Graduate Secretary

Mary Anne Davis (255 Axelrod, Ext. 56094)
mdavis@uoguelph.ca

Graduate Faculty

Josef D. Ackerman

BSc Toronto, MA SUNY, PhD Cornell - Associate Professor

James S. Ballantyne

BSc, MSc Guelph, PhD British Columbia - Professor

Nicholas J. Bernier

BSc McGill, Diploma in Aquaculture Malaspina College, MSc British Columbia, PhD Ottawa - Assistant Professor

Jim P. Bogart

BSA Toronto, MA, PhD Texas - Professor

Elizabeth G. Boulding

BSc British Columbia, MSc Alberta, PhD Washington - Associate Professor

Ronald J. Brooks

BSc, MSc Toronto, PhD Illinois - Professor

Karl A. Cottenie

MSc, MS, PhD Katholieke - Assistant Professor

Teresa J.D. Crease

BSc, MSc Windsor, PhD Washington - Associate Professor

Roy G. Danzmann

BSc, MSc Guelph, PhD Montana - Associate Professor

Moira M. Ferguson

BSc, MSc Guelph, PhD Montana - Professor and Chair of Integrative Biology

John M. Fryxell

BSc, PhD British Columbia - Professor

Jinzhong Fu

BSc Nankai, MSc Chinese Academy of Sciences, PhD Toronto - Assistant Professor

Douglas S. Fudge

BA, MAT Cornell, MSc Guelph, PhD British Columbia - Assistant Professor

Todd E. Gillis

BSc, MSc Guelph, PhD Simon Fraser - Assistant Professor

Paul D.N. Hebert

BSc Queen's, PhD Cambridge, FRSC - Professor

Denis H. Lynn

BSc Guelph, PhD Toronto - Professor

Kevin S. McCann

BA Dartmouth, MSc, PhD Guelph - Associate Professor

Gordon D. McDonald

BSc Western Ontario, MSc, PhD Calgary - Professor

Robert L. McLaughlin

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

Thomas D. Nudds

BSc, MSc Windsor, PhD Western Ontario - Professor

Beren W. Robinson

BSc, MSc Dalhousie, PhD Binghamton - Associate Professor

Vernon G. Thomas

BA Oxford, MSc, PhD Guelph - Associate Professor

Glen J. Van Der Kraak

BSc, MSc Manitoba, PhD British Columbia - Professor

Patricia A. Wright

BSc McMaster, PhD British Columbia - Professor

MSc Program

The Zoology Graduate Program offers MSc degrees in each of the three major areas of emphasis, focusing on (but 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.

Admission Requirements

To be considered, applicants must meet the requirements of a four-year honours science degree with a minimum 'B' (73%) 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. For more information regarding this requirement, applicants should consult the department's brochures: "How to Apply to Graduate School" and "Research in Zoology", which are available from the office of the graduate secretary of the Zoology program.

Under exceptional circumstances, an applicant with a 'B-' (70-72%) average during the last 2 years (four semesters) of study may be considered for admission. Such applicants must have outstanding letters of recommendation that provide strong evidence of potential research capability and a strong endorsement from a potential thesis advisor.

Admission may be granted in September, January or May. Completed applications should arrive in the department at least one full semester (four months) before the expected date of admission. Applications from international students, especially those applying for financial support, should arrive at least eight months prior to the expected date of admission.

Degree Requirements

Students must complete and defend an acceptable thesis. In addition, they must successfully complete courses totalling not fewer than 1.5 credits.

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 Zoology program should benefit from exposure to recent developments both within and between the major areas of emphasis. To that end, students may enrol in any of the regularly offered courses entitled "Advances in ...", which are team-taught by several faculty members. A selection of subjects is given in each of the course descriptions below. Details of course content, format and evaluation will be available in the office of the chair of the department one semester prior to the semester in which the course is offered.

In addition, the department offers two "Topics in..." 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..." courses at least one semester prior to the semester in which the course is to be offered.

PhD Program

The Zoology Graduate Program offers PhD degrees for studies in each of the three major areas of emphasis: ecology and behaviour, evolutionary biology, and physiology.

Admission 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. For more information about this last requirement, applicants should refer to the department's brochures: "How to Apply to Graduate School" and "Research in Zoology", are available from the graduate secretary of the Zoology program. Under exceptional circumstances admission directly to a PhD program with an appropriate honours degree alone, or transfer from MSc to PhD program without completing the MSc thesis requirements, is also possible. Applications should be received at least one full semester (four months) prior to the expected date of admission. Applications from international students, especially those applying for financial support, should arrive at least eight months prior to the expected date of admission.

Degree Requirements

The Zoology program expects that the major part of the student's time will be devoted to research in fulfilment of the thesis requirement. For that reason, the department does not require that PhD students take any courses. Even so, 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 counselling to undergraduate and MSc students. PhD students will become candidates for the PhD degree upon successful completion of an oral or written qualifying examination, which must be conducted not later than the fifth semester of the PhD program. However students are strongly encouraged to take the exam by the end of their third semester. The exam evaluates students' knowledge in the general area of the intended research. Candidates will spend not fewer than five semesters (seven without an MSc) in the program, and are expected to complete their studies within 11 semesters.

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 it is judged sufficiently meritorious to warrant publication in reputable, refereed journals in its field.

Interdepartmental Programs

MSc (Aquaculture) Interdepartmental Program

The Department of Integrative Biology participates in the MSc program in aquaculture. Those faculty members whose research and teaching expertise includes aspects of aquaculture may serve as advisors for MSc (Aquaculture) students. Please consult the Aquaculture listing for a detailed description of the MSc (Aquaculture) interdepartmental program.

Biophysics MSc/PhD Program

The Department of Integrative Biology participates in the MSc/PhD program in biophysics. Those faculty members whose research and teaching expertise includes aspects of biophysics may serve as advisors for MSc and PhD students in biophysics. Please consult the Biophysics listing for a detailed description of the graduate programs offered by the Biophysics Interdepartmental Group (BIG).

Toxicology MSc/PhD Collaborative Program

The Department of Integrative Biology participates in the MSc/PhD program in toxicology. Those faculty members whose research and teaching expertise includes aspects of toxicology 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

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.

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.

Ecology and Behaviour

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.

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 botany and zoology 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 botany and zoology 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.

ZOO*6550 Aquaculture U [0.50]

Examination of the history, practice and future of aquaculture with special reference to the application of biological principles and knowledge to the production of aquatic organisms for food and other uses.

IBIO*6630 Scientific Communication I U [0.75]

The development and refinement of the skills of scientific communication, emphasizing writing skills, in the context of developing a thesis proposal.

IBIO*6640 Scientific Communication II U [0.25]

The development and refinement of the skills of scientific communication, emphasizing oral skills, and culminating in the defence of the thesis proposal.

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. Pdraig O'Cleirigh, 244 MacKinnon, ext.53156/53883

EUROPEAN STUDIES

Coordinator: Dr. Paola Mayer, 255 MacKinnon, ext.58562/53883

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 does not presently offer programs for graduate students. Graduate students who are required by their departments to fulfil a language requirement should consult the Undergraduate Calendar. Classes in French, 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 dean 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:

Daniel Chouinard

BaSp, MA, PhD (Montréal) for SLAPSIE (MA in English/SETS) -

Stephen Henighan

BA (Swarthmore), MA (C'DIA), PhD (Oxford) (MA in English/SETS) -

Padraig O'Cleirigh

BA, MA National Univ. of Ireland, PhD (Cornell) Associate Professor (MA/PhD in History) -

Dana Paramskas

BSL, MSL (Georgetown), PhD (Laval) (MA in English and Drama/SETS) -

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.

IX. Centre for International Programs

In keeping with the mission statement of the University of Guelph, the Centre for International Programs promotes and supports all international activities at the university.

The Centre encourages the development of global awareness in academic offerings, helps to initiate exchange and study abroad opportunities for graduate students, promotes partnerships with universities and research institutions around the world, encourages research on international issues and helps to identify international research and consulting opportunities for faculty and graduate students.

As a focal point for the university's international negotiations and contractual arrangements, the Centre is a major link with external funding agencies, NGO's, government departments, private sector firms, multilateral institutions, and community groups. The Centre assists faculty members to identify funding and initiate development cooperation projects.

Given the amount of information flow relevant to the university's international mission, the Centre is an information "switchboard" to and from all corners of the campus.

The Centre has an extensive InfoCentre with information on work, study and volunteer opportunities overseas. Application forms for University of Guelph exchange programs are available from the InfoCentre. CIP also provides pre-departure preparation to students going abroad.

The Centre is also home to the International Student Advisor and provides support for the living and learning needs of international and exchange students attending the University of Guelph.

The Centre co-ordinates the programs of international visitors to campus, organizes meetings of special international interest groups, and consults extensively with individual students and faculty.

For more information, call the Centre at (519) 824-4120, Extension 56904. The fax number is (519) 767-0756; e-mail CIP@uoguelph.ca

X. Graduate Awards & Financial Assistance

Graduate students have a number of funding options. This section explains how employment, awards, grants, loans and bursaries may factor into your funding equation. It also includes a comprehensive listing of University of Guelph internal awards.

From the University of Guelph

Graduate students may expect to undertake teaching and research assistantships as an integral part of their academic programs. Before undertaking any kind of assistantship, however, graduate students must note that some fellowships, scholarships, and bursaries awarded by external agencies strictly limit the number of hours of service the holder may render to the university and/or limit the amount of money the holder may receive in some cases, from all sources. Students are responsible for abiding strictly by the terms of any such awards.

Financial assistance may be available to graduate students in several forms and combinations. These may include employment, research awards, scholarships and bursaries. Each of these is described briefly below. Students have the responsibility to ascertain precisely what remuneration will be received, if any, from the department or school in which they propose to register. The department or school has the responsibility to inform students about the duties they associate with that form of assistance.

When departments and schools make admission recommendations to Graduate Program Services, they also decide what funding (if any) will be provided to each person selected. These funding decisions may include one or more of the following:

Employment:

Graduate Teaching Assistant (GTA)

Students appointed as graduate teaching assistants will be asked to perform only teaching-related duties. These may include preparing and conducting tutorials, laboratories and seminars; grading assignments, reports and examinations, and performing other related duties. Students may hold a GTA in a department in which they are not registered.

A copy of the collective agreement between the university and CUPE local 3913 unit 1, covering GTA employment, is available for students appointed as GTAs. Students are expected to familiarize themselves with these regulations. The GTA rate of pay is established annually.

The university provides T4 and T4A tax information slips each year to students with GTAs. These forms document the appropriate taxable portions of GTA funding. These slips are mailed to students in late February each year, for the previous tax year.

Graduate Service Assistant (GSA)

The university provides a T4 tax information slip each year to students with GSAs. For income tax purposes, these forms document the money received through any GSA appointment(s). These slips are mailed to students in late February each year, for the previous tax year.

Typically, the services provided by GSAs fall into two categories: Work that is directly related to the academic enterprise but not properly a GTA or GRA. Examples of these services include the preparation of academic or administrative reports and the compilation of statistics for departmental use. This work may not contribute to the student's thesis research. A copy of the collective agreement between the university and CUPE local 3913 unit 1, covering GSA(i) employment, is available for students appointed as GSA(i)s. Students are expected to familiarize themselves with these regulations. The GSA(i) rate of pay is established annually. GSA(ii): Work that is not directly related to the academic enterprise. Examples of these services include locking/unlocking doors, cooking, cashiering, snow removal, and lifeguarding. Students are paid at the appropriate hourly rate set by Human Resources for the appropriate kind of work.

Awards

Graduate Research Assistant (GRA)

Graduate students may be supported through research grants received by faculty members from external agencies or governments. The student's research must contribute to the research of the faculty member under whose direction it is conducted. It must be used in the preparation of the student's thesis.

The dollar value of GRA stipends are based on the external granting agencies' guidelines on support of graduate students through research operating grants. GRAs must be approved by the department chair or school director on the recommendation of the adviser.

The university provides a T4A tax information slip each year to students with GRAs. For income tax purposes, the T4A documents the funds received through any graduate research assistantships. These slips are mailed to students in late February each year, for the previous tax year.

Scholarships

There is a complete list of internal awards grouped by student eligibility, i.e., by college or department affiliation and/or as awards for which students are eligible from across campus. The university reserves the right to amend these awards subject to the availability of funds.

Full-time and part-time students are eligible for all internal awards, unless otherwise stated in the eligibility clause.

Students are eligible for internal award consideration from the time they have accepted an offer of admission to a graduate program until they have graduated from that program; students must be registered in order to receive these awards. Students granted a leave of absence (see section 3.4) may defer acceptance of internal awards or interrupt acceptance of continuing awards until after the approved leave with the permission of the appropriate awards committee.

The university provides a T4A tax information slip to students each year. For income tax purposes, these forms document the money received by students in the form of awards, including department, school, college and university awards. These slips are mailed to students in late February each year, for the previous tax year.

Please note that Student Financial Services will apply all internal awards against outstanding balances on student's accounts unless prior arrangements have been made.

Travel Research Grants

Graduate students may receive travel research grants to assist them in their research. Travel research grants are given to cover your travelling expenses, including all reasonable amounts for meals and lodging, while away from home in the course of your research work.

The University provides a T4A tax information slip to students each year. Although it should be reported as income as provided in the Income Tax Act, you are able to deduct the full amount of the described expenses up to the amount of the grant. You should attach to your income tax return a list of the expenses you are deducting from the research grant. These expenses should only include those listed above. You do not have to attach receipts but should keep them in case you are later asked for them.

Entrance awards

Entry-level (semester-one) students in all departments are considered without award application for most internal awards prior to arrival and registration (see also college/school and university award descriptions). Students will normally be included in entrance-award competitions held after the date on which they accepted an offer of admission. It is strongly recommended that a completed application for graduate study be received at least six months prior to the date when the student hopes to begin graduate study. This will ensure consideration for all possible entrance awards for which the student is eligible. Students who apply less than six months in advance may miss some internal award competitions but will still be considered for appropriate awards not yet distributed.

ACCESS Awards

Terms and Conditions

To be eligible for an ACCESS AWARD students must meet government mandated terms under the OSOTF program. Students must:

1. be a Canadian citizen or permanent resident;
2. be an Ontario resident as defined by:
 - lived in Ontario for at least 12 consecutive months up to the beginning of full-time post secondary study; or
 - the student's spouse lived in Ontario for at least 12 consecutive months up to the beginning of the current year full-time post-secondary study period; or
 - the student's parent(s)/ stepparent(s)/legal guardian/official sponsor has lived in Ontario for at least 12 consecutive months up to the beginning of the current year full-time post-secondary study period;
3. demonstrate financial need as determined by the University of Guelph Needs Assessment procedures.

In-course awards

Students continuing in a graduate program of study are automatically considered for some awards and must make application for others. A list and description of all internal awards is available at Internal Awards.

Bursaries

A limited number of emergency bursaries and/or student loans are available for students who unexpectedly find themselves in difficult circumstances. Students should discuss these unexpected difficulties/costs with their adviser and graduate co-ordinator. If unresolved financial difficulties remain, they should then proceed to Student Financial Services. These funds are specifically designed to cover emergency/acute/unexpected/one-time-only situations requiring compassion and are not designed to cover registration and living costs associated with the normal continuation of study.

From Other Sources

Awards

A listing and description of external scholarships/fellowships/ awards that students may hold while registered at Guelph are maintained in Student Financial Services.

Students interested in any of the three external awards listed below are urged to direct enquiries to the address listed in each description just prior to the appropriate time of application each year:

Natural Sciences and Engineering Research Council of Canada (NSERC)

NSERC Postgraduate Scholarships

There is an annual competition for entry-level/continuing master's scholarships and entry-level/continuing doctoral scholarships. NSERC eligibility regulations are subject to change. Eligible applicants must be Canadians or permanent residents and have at least an 'A-' average (first-class standing) in each of the last two years of full-time study or equivalent part-time study, as of August 31 of the year of application.

Eligible undergraduate students must apply in the September that is at least eight months prior to entering a graduate program.

Eligible graduate students must apply in the September that is at least eight months prior to when the award would begin.

Students currently registered at a Canadian university must apply for NSERC Postgraduate Scholarships (PGSM or PGSD) through the appropriate office at the university of registration and follow its procedures and deadline dates for application submission. At Guelph, applications for postgraduate scholarships are made through the Student Financial Services.

Students who are not currently registered (more than 12 months since the last month of registration) in a Canadian University must apply directly to NSERC and follow NSERC application procedures and submission deadlines. Applications are available at any Canadian university or write to NSERC just prior to the September application period at: Scholarships and Fellowships Division, Natural Sciences and Engineering Research Council, Constitution Square, Tower 11, 14th Floor, 350 Albert Street, Ottawa, Ontario, K1A 1H5.

NSERC offers a limited number of specialized postgraduate awards which are listed in the application materials each September. Students in the appropriate disciplines are advised to review these annually.

NSERC Postdoctoral Fellowships:

Application forms are available for Canadians and permanent residents in the office of research at Canadian universities. There are various application deadline dates and postdoctoral award programs; doctoral students should note that some awards require application up to one year before doctoral degree completion.

Ontario Graduate Scholarships (OGS)

These are awarded through an annual competition for students. OGS eligibility regulations are subject to change.

There are two competitions: (i) for applicants who are Canadians or permanent residents, and (ii) for international students who are in a graduate program in Ontario and on a student visa. Eligible applicants must have at least an 'A-' average (first-class standing) in each of the last two years of full-time study or equivalent part-time study, as of the September of application.

Eligible undergraduate students must apply in the September that is at least eight months prior to the tenure of the award.

Continuing graduate students must apply in the September before receiving an award for the second year of a master's program or any of the first five years of a doctoral program. Students registered at an Ontario university must apply for an OGS through the appropriate awards office at the university where they are currently registered and follow its procedures and deadline dates for application submission; students should investigate this opportunity early in September. At Guelph, applications for OGS are made through Student Financial Services.

Canadians and permanent residents who are not currently registered must apply directly to the OGS program and follow OGS application procedures and submission deadlines. Applications are available at any Ontario university or write to the OGS program just prior to the September application period at: Ontario Graduate Scholarship Program, Student Support Branch, Ministry of Training, Colleges and Universities, P.O. Box 4500, 189 Red River Road, 4th Floor, Thunder Bay, Ontario, P7B 6G9.

Ontario Graduate Scholarships in Science and Technology (OGSST)

The Ontario government, in partnership with the private sector, rewards excellence in graduate studies in science and technology through Ontario Graduate Scholarships in Science and Technology which are valued at \$5000 per semester. Full-time Canadian citizens or permanent residents who are registered up to semester six of a master's program and semester fifteen of a doctoral program and who have a first class standing in each of their last two years of study are eligible for consideration. Students do not apply for these awards; graduate co-ordinators nominate students each semester on the basis of academic excellence as evidenced by transcripts, research ability or potential, communication and leadership skills. The OGSST is tenable with all other awards up to a total of \$10,000 per fiscal year and cannot be held at the same time as an Ontario Graduate Scholarship. It can be held for two years as master's student and for four years as a doctoral student to a lifetime maximum of four years.

Ontario Graduate Scholarship Funding (OGS and OGSST)

Donors to the University of Guelph provide up to \$5,000/yr. and the Province of Ontario provides up to \$10,000/yr. for students awarded these annual scholarships and studying at Guelph. To date, the following named endowments and annual commitments have been

generously created by private donors in support of this 2:1 government matching program, University-wide and within Colleges:

- Angela and Frank Agro Memorial OGS Fund (University-wide)
- Alumni OGS Funds (CBS, COA, CPES, CSAHS, OAC, OVC)
- Harold L. Bancroft Memorial OGS Fund (OVC)
- Bayer CropScience OGS Fund (OAC)
- Ilona Diener Memorial OGS Fund (University-wide)
- Dr. John and Joan Gandier Memorial OGS Fund (OVC)
- Gilbert's LLP OGS Fund (COA)
- Anna Hovanec OGS Fund (University-wide)
- Val Hovanec OGS Fund (OAC)
- Imperial Tobacco OGS Fund (COA, CSAHS)
- Mildred Cecile Johnston Memorial OGS Fund (OVC)
- Robert Orr Lawson Memorial OGS Fund (University-wide)
- William Mounfield Memorial OGS Fund (OAC)
- Kenneth G. Murray OGS Fund (OAC)
- National Institute of Nutrition OGS Fund (CSAHS)
- Mordechai and Bonnie Rozanski OGS Fund (University-wide)
- Scotiabank Group OGS Fund (University-wide)
- Syngenta OGS Fund (OAC)
- TD Bank Financial Group OGS Fund (University-wide)
- Dr. F. Michael Walsh OGS Fund (COA)
- Mary Yeandle Memorial OGS Fund (CSAHS)

Social Science and Humanities Research Council of Canada (SSHRC) SSHRC Doctoral Scholarships

There is an annual competition for entry-level and continuing doctoral students. SSHRC eligibility regulations are subject to change. Eligible applicants must be Canadians or permanent residents and have at least an 'A-' average (first-class standing) in each of the last two years of full-time study or equivalent part-time study, as of the September of application.

Eligible master's students must apply in the September that is at least eight months before either (i) entering a doctoral program or (ii) entering years two, three or four of a doctoral program.

Eligible students who entered a doctoral program directly upon undergraduate degree completion are not eligible to hold an award in their first year of doctoral study; they may apply in the September that is at least eight months before commencement of years two, three, four or five.

Students registered at a Canadian university must apply for SSHRC doctoral fellowships through the appropriate office at the university in which they are registered and follow its application procedures and deadlines. At Guelph, applications for these scholarships are made through Student Financial Services.

Students who are not currently registered at a Canadian university must apply directly to SSHRC and follow SSHRC application procedures and submission deadlines. Applications are available at any Canadian university or write to SSHRC just prior to the September application period at: Social Sciences and Humanities Research Council of Canada, 255 Albert Street, P.O. Box 1610, Ottawa, Ontario, K1P 6G4.

SSHRC provides a limited number of awards in addition to the doctoral scholarships. These are listed in the application materials each September. Students in the appropriate disciplines are advised to review these annually.

Grant

Some governments/agencies provide research support for students to enter and complete graduate degrees. Common examples would be (i) international government agencies funding students from their home country to study abroad, including in Canada (students should review what is available through their home country) and (ii) Canadian agencies funding study in specific areas of research (students should review opportunities through the office of research and/or appropriate office at the university in which they are registered).

Student Loans

Each provincial government and the Canadian government provide loans for undergraduate and graduate education to Canadians and permanent residents (subject to minimum residency requirements). These funds are not available to international students. Students should review the student loan policies of their home province; student loan information is normally available through universities but students should note that provincial loan forms and initial application procedures may only be available through a student's home province.

Bursaries

Some agencies, clubs and private organizations provide student bursaries for members and their immediate families; students should review what is available through any of these organizations.

University-Wide Internal Awards

Roy C. Anderson Graduate Scholarship

In honour of Roy C. Anderson, professor and former chair of the Department of Zoology, this award of \$500 is available to a student who is registered in the Faculty of Graduate Studies and enrolled in any department. The award is also aided by the Ontario government's OSOTF program. Students must be conducting research in parasitology, which includes all aspects of microbial, protozoan and metazoan infections in animals and plants. The recipient will be chosen on the basis of financial need and high academic achievement. A student may hold the award once. Apply by letter with a completed Needs Assessment Form, including a list of publications, brief research proposal, reference letter from thesis advisor and cumulative academic record to Student Financial Services by January 10. See ACCESS AWARDS.

Herbert Armstrong Memorial Book Prize

An endowment fund donated by family and friends in memory of Herbert Armstrong, Dean of Graduate Studies, 1968 - 1980, provides an annual book prize of \$120 each fall semester to a graduate student with high academic achievement who has made a substantial contribution to graduate student life and to the university while serving as a member of the Board of Graduate Studies during the previous academic year (September to August). Membership on other university Senate committees and/or university academic committees during the same period may be taken into consideration. Students do not apply; all student members of the Board of Graduate Studies are automatically considered. The selection committee is the Board of Graduate Studies Awards Committee. At the discretion of the committee, the prize may not be awarded every year.

John Black Graduate Research Travel Grants

Friends and colleagues of John Black, Chief Librarian at Guelph (1984-95) and a founding faculty member (1966-95) in the Department of Political Studies, have donated funds for outstanding students to receive travel awards up to \$500 each to assist in conducting thesis research between the second and twelfth months following first registration. Applications from students registered in Political Studies or Rural Extension Studies, or enrolled in International Development Studies and registered in any department, are considered; selection is based on previous undergraduate and graduate academic performance, research performance and publication record. Selection is by the Board of Graduate Studies Awards Committee. Students apply before December 15, providing a detailed itinerary, budget plan, time frame, description of research to be done and the name of the principal adviser, to Student Financial Services. The award may be held once and may apply to travel already completed in the current program of study.

Board of Graduate Studies: University Graduate Scholarships

The University of Guelph provides 720 awards on a competitive basis to graduate students who have achieved at least a first-class average in the previous year of academic study. The award is valued at \$2,000 per semester. Students do not apply for these awards; graduate programs nominate students each semester, and all eligible students may be considered for nomination by programs. Preference may be given to entering and first year students.

Board of Graduate Studies: Research Scholarships

The University of Guelph provides 125 awards on a competitive basis to graduate students who have achieved at least a first-class average in the previous one-year of full-time, or equivalent, study. The award is valued at the semester rate of domestic tuition at the time of the award; they are available in selected colleges in each year. Students do not apply for these awards; departments nominate each semester and all eligible students may be considered for nomination by departments. Preference may be given to entering and first-year students.

Brinson Partners Inc. Bursaries

To allow students with financial need to continue their studies as full-time students, Brinson Partners Inc., with the aid of the Ontario government's OSOTF program, has established two bursaries of \$1500 each. Students must apply by letter with a completed Needs Assessment Form to Student Financial Services by January 10. The awards will be distributed in the winter semester. See ACCESS AWARDS.

Brock Doctoral Scholarship

The Brock Doctoral Scholarship is one of the most prestigious doctoral awards available at the University. The scholarship of up to \$120,000 (\$10,000 per semester for up to twelve semesters) is awarded to the successful entering doctoral student. We seek to attract scholars with potential to attain a high level of academic and research achievement. Winners represent the very best in their College and at the University. The principal selection criterion is sustained, outstanding academic/research achievement, as demonstrated by transcripts, publication record (as appropriate to the discipline), and participation in scholarly activities such as conferences and symposia. Additional criteria may be taken into account, with lesser weighting; (i) history of leadership and/or service in schools and the community; (ii) evidence of strong teaching skills; (iii) demonstrated outstanding communication skills, and (iv) provincial, national, international or otherwise significant awards related to the discipline of study. The number of semesters of funding (to a maximum of nine) awarded will be determined at the time of candidate selection and is subject to satisfactory semesterly program performance reviews. In the last semester of the initial award, the recipients may apply for up to three more semesters of support. Students entering or transferring to a doctoral program in May, September or January following the deadline date should apply to their College Dean February 15th with a curriculum vitae, a one page personal statement; transcripts; 3 letters of reference; documentation of teaching, research, volunteer activities and leadership; which must then be forwarded to Graduate Program Services by March 1st, with the Dean's written assessment of the candidate's research and teaching potential attached.

Burnbrae Farms Bursaries

To allow students with financial need to continue their studies as full-time students, Burnbrae Farms, with the aid of the Ontario government's OSOTF program, has established two bursaries of \$1500 each. Students must apply by letter with a completed Needs Assessment Form to Student Financial Services by January 10. Preference will be given to students with a demonstrated interest in poultry science. The awards will be distributed in the winter semester. See ACCESS AWARDS.

Canadian Friends of the Hebrew University of Jerusalem Travel Scholarships

The Canadian Friends of the Hebrew University of Jerusalem, with the aid of the Ontario government's OSOTF program, have established up to three travel scholarships totalling \$7,500 per year to assist undergraduate and graduate students to visit the Hebrew University of Jerusalem. Undergraduate degree students in either the second or third year of study, masters students in the first year of study and doctoral students in the first three years of study are eligible to be considered. In addition to financial need, students will be assessed on previous academic performance in the current program of study. Applicants must provide documentation that they have approval from the Hebrew University of Jerusalem (i) to take courses and (ii) for the period of the visit. Students must also arrange appropriate University of Guelph approvals for "Letter of Permission" semester(s) abroad prior to applying. Apply by letter accompanied by a completed Needs Assessment Form to Student Financial Services by May 1. See ACCESS AWARDS.

Care-a-thon Animal Welfare Research Scholarship

This \$1000 scholarship has been established by the organizers of Care-a-thon, an annual animal welfare conference and fundraising event held at the Ontario Veterinary College. It is given to a student registered in the faculty of Graduate Studies and enrolled in any department, whose research is concerned with animal welfare. The award will be given to the student whose research is likely to have the most practical application to the improvement of animal welfare. Apply by letter to the OVC Awards Committee by January 15, including supporting letter from advisor, transcript and description of research project.

Class of '72: 25th Reunion Bursaries

To support students who wish to study full-time, but who need financial support to do so, the Class of '72: 25th Reunion Fund, with the aid of the Ontario government's OSOTF program, has established three bursaries of \$1000 to in-course students with demonstrated financial need. Students should apply to Student Financial Services with a completed Needs Assessment Form by January 10 for distribution in the winter. See ACCESS AWARDS.

Class of OAC '60 Award for Outstanding Teaching Assistant

Undergraduate and graduate students and faculty members are encouraged to make nominations at any time, accompanied by appropriate documentation. Application forms are available in Student Financial Services. These nominations will be reviewed by the Board of Graduate Studies on March 15 each year. The Senate Awards Committee will announce the annual \$1,000 award winner each April. Nomination forms may be obtained from Student Financial Services. Nomination Form for Class of OAC '60 Award for Outstanding Teaching Assistant (PDF)

CONACyT Tuition Scholarships

In support of the CONACyT program, which provides funding for Mexican students attending the University of Guelph, five scholarships valued at the difference between Canadian and International Tuition are available each year. Entering doctoral students may hold the award for up to nine semesters pending satisfactory progress. Selection will be based on academic performance including grades, publications, scholarships and awards. Graduate Co-ordinators will nominate students to Student Financial Services by August 1. The nomination should include one reference letter and a one-page summary listing publications, scholarships, and awards.

The Leonard Connolly Exchange Scholarship

In honour of Prof. Leonard Connolly, professor of drama, Chair of the Department of Drama, 1981-88, and Associate Vice-President Academic, 1988-92, students, faculty, staff and friends have endowed an annual \$1000 scholarship for an exchange student visiting the University of Guelph. Full-time visiting students, registered at Guelph for at least one semester, from any country in the South (a list of eligible countries and exchange partner universities is available in the Centre for International Programs) may apply by August 1st each year. Selection, by the Centre for International Programs, will be based on assessment of (a) a one-page submission describing the significance of the student visiting Guelph to the program of study at the partner exchange university, (b) two faculty references of one-page each, and (c) consistent high performance in the coursework completed, as documented by a transcript of program grades to date, submitted by the home university. Apply to the Centre for International Programs by May 1st, for visiting during the subsequent Fall or Winter semesters.

Dairy Farmers of Ontario Doctoral Research Assistantships

Dairy Farmers of Ontario provides a research assistantship of up to \$20,000 per year to an outstanding student entering a doctoral program at the University of Guelph. The research assistantship is for three years of full-time doctoral study. The area of research will be in an area of interest to DFO, such as marketing initiatives aimed at growing the market for dairy products; economic and business aspects of milk production and marketing, milk quality and safety, the environment; as well as dairy cattle production research related to improving animal health, welfare and performance. Doctoral applicants, with at least a first class (A⁻) average in the most recently completed two years of academic study, should arrange to have a complete application for a doctoral program of study and an assistantship application on file in Graduate Program Services before January 10th each year. The assistantship application includes a one-page research proposal, 2 letters of reference, publication record, transcripts, documentation of academic and professional experience and lists the proposed graduate faculty advisor at the University of Guelph. The student selected will begin the doctoral program and research assistantship the following May, September of January. Dairy Farmers of Ontario Doctoral Research Assistantship Application (PDF)

Clan Fergusson Graduate Research Travel Grant

An endowment fund has been established in memory of deceased members of the Clan Fergusson Society of North America. The initial donation was from the estate of Donald MacNish Fergusson, "a Scotsman to the Marrow..." The funds are used to provide travel grants totalling approximately \$500 to Guelph graduate students to visit Scotland for thesis research. Registered graduate students with at least a first-class (A⁻) average in the most recent two years of study whose thesis research relates to Scottish studies are eligible, including study in drama, English, family studies, history, philosophy and sociology. Students make application by December 10 each year, including an application form (available in Student Financial Services and below) and a letter of reference from the principal advisor. Selection is by the Board of Graduate Studies Awards Committee in January each year, for travel by a registered student between February and the following January. Students who would be at or beyond semester 5 at the master's level or semester 7 at the doctoral level at the time they would be travelling are ineligible to apply. Application Form for the Clan Fergusson Graduate Research Travel Grant(PDF)

Madame Vigdis Finnbogadottir Scholarships

In honour of the visit of the former Icelandic President Madame Vigdis Finnbogadottir in 1998, the University of Guelph provides two scholarships equal to the difference between international tuition and Canadian tuition. Icelandic students pursuing a graduate degree at the University of Guelph are eligible up to their sixth semester of registration at the master's level, ninth at the doctoral level, and twelfth in the case of a transfer from master's to doctoral studies. No application is necessary, students will be nominated to the Board of Graduate Studies Awards Committee by the Icelandic Exchange Co-ordinator.

The D.F. Forster Medal

The most prestigious graduate student award at the University of Guelph, this medal is awarded annually to the convocating graduate student who excels both academically and in extracurricular activities. One student is nominated each year by each college awards committee. The deadline date for nominations is May 1. The Senate Awards Committee will make the final selection, with the announcement and/or presentation at June convocation. No application is necessary.

Cecil H. Franklin Graduate Scholarship in Soil and Water Conservation

Cecil H. Franklin provides a one-year award valued at \$5,000 to an MSc or PhD student whose research is related to soil and/or water conservation. Application forms are available in Student Financial Services and must be completed by April 1 each year. Students offered admission and in-course are eligible; tenable with other Senate awards. Application Form for Cecil H. Franklin Graduate Scholarship in Soil and Water Conservation (PDF)

Governor General's Academic Medal

The Governor General's Academic Medal program provides for one recipient of a gold medal to be selected by the University of Guelph for outstanding academic achievement at the master's level of study each year. Students do not apply for consideration for this award; all students who graduate from a first master's degree in the previous June, October and February convocations will be considered by their college or university school awards committee for nomination. Each college or university school will nominate one student to the Board of Graduate Studies Awards Committee by May 1 each year. The nomination package should include the following: a summary letter from the College; a two-page summary of biographical information on the candidate to include basic information, the academic record, scholarly/research activities, and teaching experience; and two letters of reference. The decision of the Board of Graduate Studies Awards Committee will be based entirely on this information.

Graduate Students' Association Volunteering Award

The Graduate Students' Association annually provides a \$250 award to a graduate student who is registered in the Faculty of Graduate Studies or who has graduated in the previous Fall or Winter convocations. The recipient will be selected on the basis of academic performance and participation in the social, political and/or cultural activities within or outside the University while enrolled in a graduate program. Applicants must have completed at least one semester of their current graduate program. This award may be held only once. . Submit a letter of application and resume to Student Financial Services by April 1.

Gryphon Investment Counsel Bursaries

To allow students with financial need to continue their studies as full-time students, Gryphon Investment Counsel, with the aid of the Ontario government's OSOTF program, has established two bursaries of \$1500 each. Students must apply by letter with a completed Needs Assessment Form to Student Financial Services by January 10. The awards will be distributed in the winter semester. See ACCESS AWARDS.

Guelph Compassionate Health Bursary

This bursary has been established and approved by the Student Health and Dental Committee to assist students facing unforeseen health needs above and beyond the benefits offered through the mandatory University of Guelph student health plan. To be eligible for this assistance, students must be registered on the University of Guelph student health plan, submit a University of Guelph Need Assessment Form and qualify for funding. This application must be accompanied by the physician recommendation, cost estimates and contact information. Applications will be reviewed throughout the semester to handle emergencies immediately.

Frances Hucks Memorial Research Scholarship

The estate of Mary F. Hucks, (MAC '26) and honorary class president of (MAC '30) has provided, with the aid of the Ontario Government's OSOTF program, an endowment for an annual scholarship of \$5000 for graduate students who have demonstrated financial need and are conducting research with a focus on human food, human nutritional health and/or biotechnology related to human food or nutrition. Masters or doctoral students may hold the scholarship once per degree. The recipient will be the person with demonstrated financial need who has the highest academic performance over the most recent two years of full-time or equivalent university study. A letter of application accompanied by a Needs Assessment Form, a one page thesis research proposal and a one page letter of reference from the principal advisor must be submitted to Student Financial Services by April 1 for consideration for a Spring semester award. Students cannot be beyond the start of the 12th month of study on April 1 and may hold the award only if registered in the following Spring semester. See ACCESS AWARDS.

Richard and Sophia Hungerford Graduate Scholarships

The estate of Richard and Sophia Hungerford, with the aid of the Ontario government's OSOTF program, has established an endowment to support graduate students in financial need whose research interests relate to developing countries. The fund provides seven annual awards of \$5000 each. Registered or incoming graduate students with at least a cumulative 80% average in their last two years are eligible. Students are ineligible if beyond semester 5 at the masters level and semester 7 at the doctoral level. Recipients will be selected on the basis of financial need, academic achievement, and the quality of their intended research in developing countries. Apply to Student Financial Services by March 1 including a one page summary of the research proposal, a completed Needs Assessment Form, and a letter of reference from the principal advisor. See ACCESS AWARDS.

Richard and Sophia Hungerford Graduate Travel Grants

The estate of Richard and Sophia Hungerford, with the aid of the Ontario government's OSOTF program, has established an endowment to provide travel grants to undergraduate and graduate students with demonstrated financial need who wish to study in developing countries. (A CIDA list is available in Student Financial Services, identifying eligible countries for travel.) The fund creates a number of travel grants, from \$500 to \$3,000 each, totalling a minimum of \$100,000 in awards annually. Registered undergraduate students and graduate students with demonstrated financial need who have a minimum 70% cumulative average in the last two semesters of full-time equivalent study are eligible. The value of the award will depend on assessed need. Apply to Student Financial Services with a description up to two pages in length of the intended travel, an estimate of the travel costs and a completed Needs Assessment Form prior to departure. Application deadlines are October 1 for Winter travel, February 1 for Spring travel and June 1 for Fall travel. Selection will be based on financial need and the relevance of the proposed travel to the student's area of study. Students may receive up to two awards during undergraduate studies and up to two awards during graduate studies. See ACCESS AWARDS.

ICI Scholarship in Biotechnology

An annual scholarship of \$2,500, tenable with other Senate awards, may be awarded to an MSc or PhD student registered in a department or school at the University of Guelph who is doing research in biotechnology. The student must have a first-class ('A') average in the two years of university work (courses and/or research) completed prior to May 2 each application year: all previous university transcripts will be reviewed, as will an application reference letter from the previous/current advisor. Apply to Student Financial Services by May 1. The selection committee is the Board of Graduate Studies Awards Committee.

The Arthur D. Latornell Graduate Scholarships

An endowment fund has been established in memory of Arthur D. Latornell, OAC '50, who had a life-long special interest in resource management and conservation and in helping young people. The fund provides for up to ten annual awards of \$5,000 each. Registered or incoming graduate students in any college with at least a first-class ('A-') average in the last two years whose research interests relate to resource management and/or resource conservation are eligible. One of the ten awards is available to a student whose research interest relates to resource remediation/reclamation. Students beyond semester three at the master's level, semester six at the doctoral level, and semester nine in the case of a transfer from master's to doctoral level are ineligible. Recipients will be selected on the basis of academic achievement and/or quality of their graduate research. Students do not apply directly. Departments may nominate students to Student Financial Services by October 15 using the Latornell Graduate Scholarship nomination form. Application Form for Arthur D. Latornell Graduate Scholarships (PDF)

The Arthur D. Latornell Graduate Research Travel Grants

An endowment fund has been established in memory of Arthur D. Latornell, OAC '50, who had a life-long special interest in resource management and conservation and in helping young people. The funds are given to provide up to 50 travel grants totalling approximately \$27,000. These travel grants are offered to assist students in attending conferences, courses, co-op student exchanges or study abroad programs in these areas. Registered or incoming graduate students in any college with at least a first-class ('A-') average in the last two years whose research interests relate to resource management and/or resource conservation are eligible. One travel award is available for a student whose research interest relates to resource remediation/reclamation. Students beyond semester six at the master's level, semester nine at the doctoral level, and semester twelve in the case of transfer from master's to doctoral level are ineligible. Students do not apply. Departments may nominate students to Student Financial Services by October 15 for the fall competition or March 15 for the winter competition using the Latornell Graduate Travel Scholarship nomination form. Application Form for Arthur D. Latornell Graduate Research Travel Grants (PDF)

Doug and Esther Ormrod Scholarships for Parents

In celebration of Dr. Ormrod's twenty-six years as a faculty member and nine years as Dean of Graduate Studies (1986 - 1995), Dr. Ormrod, his wife Esther, OAC Class of '75, faculty, staff, friends and the university have endowed awards of \$500 each for outstanding graduate students. Students must be parents with a child or children in day care (public or private) and beyond the first semester of full-time or part-time study at the time they hold this award; students may hold the award once while at Guelph in a master's program and once in a doctoral program of study. Master's students beyond a sixth registration (first two years of study) and doctoral students beyond a ninth registration (first three years of study) are not eligible. Students with a first-class ('A-') average in the last two years of full-time or equivalent part-time study may complete an application form in Student Financial Services any time before December 1 each year. The Board of Graduate Studies Awards Committee will select recipients annually each winter semester. Application Form for Doug and Esther Ormrod Scholarships for Parents (PDF)

Registrar's Research Travel Grants, Child Care Grants and Research Grant for Graduate Students

In order to assist graduate students in travel related to their research needs, child care costs, and research needs, a portion of the tuition reinvestment revenue is being set aside for these grants. Applicants must be Canadian citizens or permanent residents and must demonstrate financial need by completing a Financial Needs Assessment form. Winners will be selected by the Board of Graduate Studies awards committee on the basis of financial need, academic ability, and the strength of the proposal. The travel must take place within the year following the award. Upon their return, students must submit a written report, along with receipts, to Student Financial Services. The award may be held only once for each degree. Application forms are available in Student Financial Services, or below as a PDF, and must be submitted, along with the completed Financial Needs Assessment form by January 10. Application Form for Graduate Student Travel Grant (PDF), Application Form for Registrar's Child Care Grant (PDF), Graduate Student Financial Needs Assessment Form (PDF)

Arthur Richmond Memorial Scholarships

In memory of the late Arthur Richmond (OAC '23), horticulturist and teacher, four \$3500 scholarships are awarded annually to outstanding graduate students in Botany, Environmental Biology, Plant Agriculture (Horticultural Sciences), Microbiology or Zoology who are not beyond semester six as a master's student or semester nine as a doctoral student. The winners shall be selected on the basis of academic excellence. One award each year is reserved for a student in the Plant Agriculture (Horticultural Sciences) program. Apply to Student Financial Services by May 1 with an academic curriculum vitae, a one-page summary of research and one reference letter.

Scotiabank Bursaries

In order to allow students with financial need to continue their studies as full-time students, Scotiabank, with the aid of the Ontario government's OSOTF program, has established two bursaries of \$1500 each. Students must apply by letter with a completed Needs Assessment Form to Student Financial Services by January 10. The awards will be distributed in the winter semester. See ACCESS AWARDS.

Orville E. Sinclair Research Scholarship

An annual scholarship of \$400 is awarded to an MSc student who is conducting research related to fluid milk by improving methods of production on the farm or by improving methods of processing and/or packaging at the milk plant. Academic standing and financial need will determine the recipient from those eligible for the award. Apply to Student Financial Services by June 1. The selecting committee will be the Awards Committee of the Board of Graduate Studies. It is tenable with other Senate awards.

University of Guelph ACCESS Scholarships

To support undergraduate, graduate or OAC(Guelph) diploma students who wish to study full-time but who need financial support to do so, alumni and friends of the University have provided un-designated funds, with the aid of the Ontario government's OSOTF program, have established bursaries for in-course students. The bursaries range from \$500 to \$2000 depending on financial need. Apply to Student Financial Services with a completed Needs Assessment Form by January 10 for distribution in the winter. See ACCESS AWARD.

University of Guelph Child Care Bursaries

In order to provide accessible child care for students with (a) child(ren), the University of Guelph will provide up to twelve Child Care bursaries ranging from \$500 to \$2000 annually, up to a total of \$6000. These bursaries will be awarded to students supporting (a) child(ren) who demonstrate greatest financial need, to offset the costs of child care. To be eligible, graduate students must be full-time (as defined by OSAP regulations) and Canadian citizens or permanent residents with demonstrated financial need. Apply to Student Financial Services with a completed Needs Assessment Form by December 15 for distribution in the winter semester. Application Form for University of Guelph Child Care Bursaries (PDF).

University of Guelph Research Travel Grants

The University of Guelph, through the sale of Guelph London House, has established an endowment to provide travel research grants to undergraduate and graduate students who wish to study overseas but need financial support to do so. The fund creates a number of awards of variable amounts (\$500, \$1000 or \$1500), with a total of \$35,000 available. Registered undergraduate and graduate students with demonstrated financial need who have a minimum 70% cumulative average in the last two semesters of full-time equivalent study are eligible to apply. The value of the award will depend on the assessed financial need. The scholarship can cover additional costs of travelling overseas including: airfare, administrative costs, and differential costs of accommodation. Apply to Student Financial Services with a description of the intended travel, an estimate of the travel costs and a completed Needs Assessment Form prior to departure. Application deadlines are October 1 for Winter travel, February 1 for Summer travel and June 1 for Fall travel. Graduate Student Financial Needs Assessment Form (PDF), Application Form for Graduate Student Travel Grant (PDF)

The W.N. Vaughan Medal

A medal may be given annually to a student senator who has high academic standing and who has made a substantial contribution to student life and to the university, particularly through involvement in and commitment to Senate activities. Prospective candidates will be nominated by senators and the medal winner will be chosen by a committee selected by the Senate Bylaws and Membership Committee. The medal will be awarded at June convocation. No application is necessary.

Mary I. Whitelock Bursaries

To support students who wish to study full-time but who need financial support to do so, the estate of Mary I. Whitelock, a friend of the University, with the aid of the Ontario government's OSOTF program, has established thirteen bursaries of \$2000 to in-course undergraduate, graduate or OAC diploma students with demonstrated financial need. Students should apply to Student Financial Services with a completed Needs Assessment Form by January 10 for distribution in the winter. See ACCESS AWARDS.

College of Arts Internal Awards

Nancy Bailey Graduate Teaching Prize

(School of Literature and Performance Studies in English) In honour of retired Prof. Nancy Bailey in recognition of her excellence as a teacher, an annual prize of \$100 is made each winter semester to an outstanding graduate teaching assistant in the department. All School of Literature and Performance Studies in English students who provided teaching assistance in the previous winter, spring and/or fall semesters are eligible. No application is necessary.

Alexander H. Brodie Memorial Award (Scottish Studies)

Gifts from friends of the late professor Alexander H. Brodie make possible financial assistance to an MA (or, if none are eligible, PhD) student for thesis research overseas related to Scottish studies. Application should be made to the Interdepartmental Committee on Scottish Studies by March 15.

Canadian Federation of University Women - Guelph (Fine Art)

An annual scholarship of \$500 will be presented to a Master of Fine Art student whose work in studio and/or art history classes is considered outstanding. Preference will be given to a practicing female artist. Applicants should submit portfolios to the Chair of the Fine Art Department by January 15. This award is funded by the Guelph Chapter of the Canadian Federation of University Women, which assists women to obtain higher education.

Robert Carr-Wiggin Prize (Philosophy)

This \$200 award was established by the Guelph Philosophical Society in memory of Robert Carr-Wiggin, one of the first students to graduate from the PhD program in Philosophy. It is given to the graduate student in philosophy for the best paper that has been submitted to either a scholarly journal or a scholarly conference during the preceding year. Applications must be submitted to the Chair of the Department of Philosophy by May 1 each year.

Lin Coburn Memorial Graduate Scholarship

This award, of up to \$4,000, is provided by the family, colleagues and friends of Lin Coburn, with the assistance of the Ontario government's OSOTF program. The award is for an entering full-time English PhD student, within the School of English and Theatre Studies, who embodies and inspires a dedication for and a love of learning. Selection criteria include financial need for the first year of doctoral study and all academic performance in the previous degree of study. The School of English and Theatre Studies Awards Committee will review applications received from Student Financial Services and contact selected applicants for copies of their academic portfolios, including but not limited to reviews of grades in courses completed to date, essays and papers submitted for those courses etc. Students may hold the award only once. Apply to Student Financial Services by January 10, with a completed Financial Need Assessment Form and a letter (maximum of two pages), expressing interest in the award and listing any essays and/or other written materials from courses completed in the previous degree of study. ACCESS AWARD.

Ted Cowan Scholarship (Scottish Studies)

Prof. Cowan, for many years chair of Scottish studies in the Department of History, made major contributions to raising the awareness of Scottish studies both in the academic world and among the public as a whole. The award funds were raised by private donations and a grant from the Scottish Studies Foundation. In even numbered years, \$500 is awarded to support research travel for a Guelph student in Scottish studies. PhD students who have completed or anticipate completing their qualifying examination, and MA students who have completed two semesters, may submit an application, including proposed research trip budget and statement of research plan, to the graduate coordinator of the department of registration by September 1. Preference will be given to PhD students.

College of Arts Graduate Research Bursary

Supporters of the College of Arts, with the aid of the Ontario government's OSOTF program, have established a \$500 bursary to assist a graduate student with demonstrated financial need with the costs associated with a special activity, such as research travel or conference attendance. Applicants should submit a completed Needs Assessment Form to Student Financial Services, and a letter outlining the importance of the proposed activity and the associated expenses to the Chair of the College of Arts Awards Committee, by January 10. The award may be divided between two students at the discretion of the Committee and may be awarded retroactively for travel in the previous semester. See ACCESS AWARDS.

Department of English Outstanding Thesis Prize (English)

The department has an annual book prize to recognize outstanding achievement in the MA thesis, including the creative thesis option. No application is necessary

John Galt Scholarships (History)

The John Galt Scholarships were established by the faculty of the Department of History with the aid of the Ontario government's OSOTF program, to attract the most promising graduate students to the MA and PhD programs in History. Two scholarships of \$1,500 each are available. They will be awarded to entering students who demonstrate financial need who have maintained a minimum cumulative 80% average. A student can be awarded more than one scholarship and these may be paid over more than one year, but the offer may be made only at the point of entry into the program. The payment of the scholarship in succeeding years will be conditional on continued financial need and on the maintenance of a minimum cumulative 80% average in the previous two years. Apply by letter with a completed Needs Assessment Form to Student Financial Services by January 10. See ACCESS AWARDS.

The Jane Nelson Stirling Cairns Grier Scholarship in Scottish Studies

Established by Ms. Jane Nelson Stirling Cairns Grier, this \$1000 scholarship will be awarded to a student in his/her first or second year of graduate study in the field of Scottish Studies within the MA or PhD programs in History who demonstrates a keen interest in Scottish history and has a minimum academic standing of 80% upon entry to the program or after the first year of study. The scholarship has been established to encourage and support the study of Scottish History in Ontario, and particularly to recognize those students from other provinces who choose the University of Guelph for their graduate studies in Scottish History. No application is necessary.

Department of History Graduate Prizes (History)

\$100 prizes will be awarded in May to students who have written (i) an outstanding thesis, (ii) an outstanding major paper, and (iii) an outstanding course essay during the preceding twelve months. Students do not apply; all theses and major papers will be considered. Instructors will nominate course essays. Prizes may not be given out in each category every year.

Betty King Memorial Graduate Scholarship (English)

The \$500 award commemorates the work of Betty King, a staff member in the former Department of English and the School of Literatures and Performance Studies in English from 1990 to 1998. Betty was particularly caring and helpful to graduate students in the College and significantly contributed to a supportive work environment for colleagues. Currently registered full-time MA students in the School of English and Theatre Studies (SETS) who are entering the third semester of study will be considered annually, if they have not received internal and/or external awards totalling \$5000 or more during their first year of MA study. The student assessed as having the highest academic performance (both in completed courses and in research progress to date) after the first two semesters of study in the program are completed, will be recommended by the SETS Graduate Awards Committee to the College of Arts Awards Committee. No application is necessary.

Lambda Foundation Scholarship in LBGT Studies

The Lambda Foundation/Fondation Lambda, along with other donors, provides this \$1,000 scholarship to encourage research on the subject of lesbian, bisexual, gay and transgendered (LBGT) peoples. The scholarship is based upon areas of research pertaining to the history, contributions, and issues by or about LBGT peoples. Eligible students include all students enrolled in an undergraduate or graduate program with a thesis, a research proposal, essay, independent research project or course work programs pertaining to LBGT studies, as broadly defined by the applicant. Preference will be given to an applicant who is involved in the LBGT community as demonstrated by a record of volunteer activities, active civil society memberships, or as attested by a letter of recommendation from a community group, or as evidenced by related previous academic pursuits. This scholarship may be awarded to a given student only once. Projects must have been completed or research proposals accepted within the past calendar year. Apply to the Dean of Arts by December 15 including the research proposal or completed project, curriculum vitae, and any supporting letters referencing involvement in the LBGT community and/or faculty support.

Leslie Nielsen Dramatic Arts Scholarship

In honour of Canadian actor Leslie Nielsen, the Neal Dawkins Mentorship Trust presents this annual award of \$5,000 each Summer to an outstanding graduate student registered in Drama, English, or Fine Art, whose research is related to performance. Departments will automatically consider for nomination students with a minimum cumulative average of A- in their first two semesters of graduate study. Selection will be based on the project's contribution to the study of performance; projects that focus on the processes of writing, directing, or performative practices will receive particular consideration. The award may be held only once and may not be shared.

Helen O'Reilly History Scholarship (History)

To commemorate Helen O'Reilly, a mother who entered university as a mature student and went on to pursue graduate studies in history, her family, with the aid of the Ontario Government's OSOTF program, has established a scholarship of up to \$1000 annually for a graduate student in the Department of History who has superior academic standing and demonstrated financial need. Apply to Student Financial Services with a completed Needs Assessment form by January 10. See ACCESS AWARDS.

Margaret Priest Graduate Scholarship (Fine Art)

Margaret Priest, University of Guelph Professor Emerita and accomplished artist, provides this \$1000 scholarship to a student entering the Master of Fine Art program with a minimum cumulative academic standing of 80% and demonstrated exceptional studio work (drawing and architecture) as evidenced by portfolio submitted with application to the Master of Fine Art program. No application is necessary.

Tony Scherman Graduate Scholarship (Fine Art)

Tony Scherman, Adjunct Professor of Fine Art, friend of the University and accomplished artist, provides this \$1000 scholarship to a student entering the Master of Fine Art program with a minimum cumulative academic standing of 80% and demonstrated exceptional studio work (specifically in painting) as evidenced by a portfolio submitted with application to the Master of Fine Art program. No application is necessary.

Scottish Studies Foundation Graduate Scholarship

Through the generosity of the Scottish Studies Foundation and private donors, and with the assistance of the Ontario government's OSOTF program, this scholarship has been made available annually to an Ontario resident with demonstrated financial need who enters the Scottish Studies Programme at the University of Guelph. The scholarship provides \$1500 in the first year and, providing the student maintains a Scottish Studies focus and an A- average, \$1500 in the second year of study. Doctoral studies will be given first consideration. If none are eligible, Masters students will be considered. Eligible students should request the graduate committee of their Department or School to forward their names and application materials to the Scottish Studies Committee for consideration and submit a completed Needs Assessment Form to Student Financial Services by January 10. See ACCESS AWARDS.

Shuebrook Graduate Scholarship (Fine Art)

This \$500 award was established in honour of Ron Shuebrook, Chair in the Department of Fine Art 1988 to 1993 and past Graduate Coordinator of the MFA program. Colleagues and friends, with the aid of the Ontario government's OSOTF program, have created this award to celebrate his passionate commitment and devotion to the development and well-being of the School of Fine Art and Music. Entering or continuing MFA students who have a minimum average of 80% in the previous year of undergraduate or graduate study and who submit at least ten slides of their creative work are eligible. Apply to Student Financial Services by January 10 and include a completed Needs Assessment Form. Submit slides to the MFA committee of the School of Fine Art and Music. See ACCESS AWARDS.

Carole Stewart Arts Graduate Scholarship

Alumni, friends and colleagues have endowed this annual \$4000 entrance award in recognition of Carole Stewart's contributions to the College of Arts from 1966 to 2001, including terms as Chair of the Department of Philosophy, from 1985 to 1992, and Dean from 1993 to 2001. All entering full-time graduate students in the College of Arts are eligible. Awards will be made based on academic achievement and will be rotated among programs in the following order: the School of Fine Art and Music, the Department of History, the Department of Philosophy, and the School of Literatures and Performance Studies in English. The College of Arts Awards Committee on the recommendation of the Department offering the award in any given year will automatically consider applicants who have attained a consistently high level of academic achievement.

The Edward Stewart Scholarship in Scottish Studies

This scholarship was created by friends and family of the late Dr. Edward Stewart, former Deputy Minister of Education and Secretary of Cabinet in the Ontario Government, to honour his lifelong interests in higher education, Scottish culture and history. The scholarship will provide \$5,000 to a graduate student in the first or second year in the field of Scottish Studies (M.A. or Ph.D. Programs in History) with a minimum cumulative average of 80% upon entry to the program or after the first year of study. Selection will be based on highest cumulative average. No application is necessary.

The Tri-University Doctoral Program Annual Prize for the Best Historiographical Paper(History)

This \$100 prize will be awarded each fall to the graduate student in the Tri-University doctoral program in History who has authored the highest quality historiographical paper submitted in a Tri-university seminar during the previous Fall, Winter, or Spring semesters. The selection committee may decide not to give the award in any year where, in the committee's judgement, there is not a paper of sufficiently high quality. Selection will be made by the Program Coordinating Committee.

The Tri-University Doctoral Program Annual Prize for the Best Scholarly Paper or Article (History)

A \$100 prize will be awarded each fall to the graduate student in the Tri-University Program in History who has authored the best scholarly paper or article submitted for consideration by a conference or journal during the preceding academic year. Apply to the Chair, Department of History, by September 1, submitting a copy of the paper or article and proof of its submission to a journal or conference. Selection will be made by the Program Coordinating Committee.

The Michael and Virginia Walsh Scholarships in Philosophy (Philosophy)

Michael Walsh, BA '69, MA '70, PhD '93, and Virginia (Trimble) Walsh, BA '72, with the Ontario Student Opportunity Trust Fund, have endowed two scholarships for philosophy students. All BA students majoring in philosophy, with demonstrated financial need, who are at or beyond semester 5, with at least an 80% (first class) average in all courses completed to date, are eligible to apply to Student Financial Services by January 10 for a \$1000 award. All MA and PhD students in philosophy with demonstrated financial need, who are at or beyond semester 3 and not beyond semester 6, and have at least an 80% average (first class) average in all graduate work (course and research) completed to date, are eligible to apply to Student Financial Services by January 10, for a \$1,500 award. All applicants must provide a completed Needs Assessment Form. Selection of the most outstanding undergraduate and graduate student, by the College of Arts Awards Committee, is on the recommendation of the Department of Philosophy Awards Committee, from eligible undergraduate and graduate students with demonstrated financial need. See ACCESS AWARDS.

Paul M. Waters Memorial Award (English)

The Paul M. Waters family, in honour of Paul Waters (MA '89), has established a \$500 award for a student who has completed two semesters in the English MA program and who has gained the respect of fellow graduate students both by demonstrating a high level of commitment to academic and community activities and by a light-hearted perspective toward all endeavours. Graduate students currently enrolled in the Department of English should submit their nomination to the chair, Department of English, before March 15. Selection of the winner will be made by the College of Arts awards committee and the dean of Graduate Studies. Completed applications, accompanied by a transcript of record, should be made to the dean of the College of Arts by June 1.

Frank Watson Travel Scholarship (Scottish Studies)

Dr. Cecily Watson and the Scottish Studies Foundation provide this \$1000 Scholarship for MA and PhD students in the Scottish Studies Program who intend to visit Scotland for their thesis work. Applicants will be eligible after the successful completion of their comprehensive examinations. Preference will be given to PhD students, but if no PhD students qualify, MA students with a minimum cumulative average of 80% (A-) will be considered. Selection will be based on relevance of intended travel to the student thesis work. Apply by February 1 for travel between April of current year and April of the following year to the Chair of Scottish Studies with an outline of the purpose and duration of travel to Scotland.

College of Biological Science Internal Awards**Prof. A.W. Baker Memorial Bursaries**

The estate of Margaret A. MacLean, through a bequest in honour and memory of her father the late Prof. A.W. Baker, Chair of the Department of Entomology, with the aid of the Ontario government's OSOTF program, provides bursaries of up to a total of \$3,000 annually for students with demonstrated financial need who are registered in the Faculty of Graduate Studies who are registered in the Faculty of Graduate Studies and enrolled in a department in the College of Biological Sciences or the Ontario Agricultural College. Full-time or part-time continuing or in-coming MSc students not beyond semester 5 or PhD students not beyond semester 9, studying or conducting research in entomology are eligible. Apply by letter describing research project and research interests accompanied by a curriculum vitae and completed Needs Assessment Form to Student Financial Services by January 10. See ACCESS AWARDS.

CBS Graduate Scholarship in Botany (Botany)
Dr. R.L. Peterson and alumni and friends of CBS, with the aid of the Ontario government's OSOTF program, have established a \$500 graduate scholarship for students with demonstrated financial need. It will be awarded to an eligible full-time MSc student not beyond semester 5 or a full-time PhD student not beyond semester 9, pursuing graduate studies in the Department of Botany. Apply by letter describing research project and research interest, accompanied by a curriculum vitae and completed Needs Assessment Form to Student Financial Services by January 10. See ACCESS AWARDS.
Elgin Card Terrestrial Zoology Scholarship (CBS)
The Ontario Waterfowl Research Foundation provides an award of \$4,000, to students in a graduate program in the college. The applicant must have a high academic standing and demonstrated interest in the area of terrestrial zoology. The scholarship may not be held in conjunction with any external awards that provide the student with \$10,000 per year or more. Apply to the Administrative Assistant in Zoology by September 30.
Hagen Graduate Scholarship
Rolf Hagen, founding president of Rolf C. Hagen Inc., Canadian pet food and products supplier, with the aid of the Ontario Government OSOTF program, has established two \$1250 graduate scholarships for students with demonstrated financial need. They will be awarded to eligible full-time MSc students not beyond semester 5 and full-time PhD students not beyond semester 9. Annually, if possible, one will be awarded to an MSc student and the other to a PhD student. Preference will be given to students with an interest in tropical and/or marine fish or aquaculture, doing their research in the Hagen Aqualab. Apply by letter describing the research project and research interest, accompanied by a curriculum vitae and completed Needs Assessment Form to Student Financial Services by January 10. See ACCESS AWARDS.
Harold H. Draper Graduate Prize (Human Health and Nutritional Sciences)
In honour of Professor Draper, chair of the Department of Nutritional Sciences from 1975 to 1985, a \$100 prize may be given to the graduate student who is judged to have contributed most effectively to the course Graduate Seminar, 7106500, during the previous year. No application is necessary.
Norman James Aquatic Zoology Scholarship (CBS)
The Ontario Waterfowl Research Foundation provides an award of \$4,000, to students in a graduate program in the college. The applicant must have a high academic standing and demonstrated interest in the area of aquatic zoology. The scholarship may not be held in conjunction with any external awards that provide the student with \$10,000 per year or more. Apply to the Administrative Assistant in Zoology by September 30.
Middleton Graduate Teaching Assistant Prize (CBS)
The Middleton Graduate Teaching Assistant Prize was established to honour Dr. A.L.A. Middleton, professor in the Department of Zoology from 1966 - 2001, for his contribution to undergraduate education at the University of Guelph. Recipients must demonstrate a commitment to and effectiveness in undergraduate teaching as evidenced by letters of support from course supervisors. Students may be nominated by faculty, departmental technicians, or undergraduate students. The nomination forms are available from the Chair's office and must be completed and returned by April 30. The recipient's name will be engraved on a plaque, which will be displayed in the Department of Integrative Biology.
The Pharmacia Microbiology Graduate Award (Microbiology)
An award of \$500 is made annually to the graduate student enrolled in the Department of Microbiology who is judged to have presented the best poster at a scientific meeting during the academic year. Posters must be exhibited by the student or designate during the last week of August. The best poster will be selected on the basis of academic merit by a vote of the Faculty in the department of Microbiology. No application is required.
Dr. Donald Robert Phillips Molecular Biology and Genetics Scholarship
This scholarship was established by the estate of Beverly Phillips, in memory of her brother Dr. Donald Robert Phillips, OAC '66, a genetics researcher. The fund provides one award of \$8500 in the Winter Semester annually. This award is open to students enrolled in a graduate program in the Department of Molecular Biology and Genetics. While primary consideration will be given to contributions to research as evidenced by authorship of publications and conference presentations in the area of molecular biology and genetics, academic achievement at the graduate level and prior recognition in the form of other graduate awards will also be taken into account. Apply to the Chair of the Department of Molecular Biology and Genetics. All applicants must submit a cover letter, application form (available from the graduate secretary), two letters of support (one of which should normally be written by the student's advisor) and a copy of publications by February 1, of each year.
Arthur Richmond Memorial Scholarships (CBS/OAC)
In memory of the late Arthur Richmond (OAC '23), horticulturist and teacher, four scholarships of \$3,500 each may be awarded annually to outstanding graduate students in botany, environmental biology, horticultural science, microbiology or zoology. Apply to the dean, Graduate Studies, by May 1.

Robinson Research Travel Grants (CBS Microbiology, OAC Environmental Biology)
These two annual graduate awards of \$400 each are tenable with other Senate awards. Graduate students in the Department of Microbiology in CBS are eligible for one award and graduate students in the Department of Environmental Biology in OAC are eligible for the other. Academic standing will be used to determine the recipient. The funds are to be used to defray costs to attend scientific meetings. Preference will be given to students presenting a paper at a meeting. Application is to the chair of the Department of Environmental Biology, OAC, or the chair of the Department of Microbiology, CBS, as appropriate by January 31 for travel in the period March 1 each year to February 28 of the succeeding year. The selection committee will be the appropriate college awards committee on recommendation of the chair of the department. The time of presentation to be arranged by the college awards committee. Donor - family, friends and associates of the late Dr. John Robinson.
Roche Molecular Biochemical Award of Excellence (Microbiology)
An award of \$500 may be made annually to the graduate student registered in the Department of Microbiology who has presented the best graduate seminar during the academic year. No application is necessary.
Keith Ronald Graduate Scholarship (CBS)
Established in the honour of Professor Keith Ronald, founding Dean of the College of Biological Science, with the assistance of the Ontario government's OSOTF program, this fund provides an annual \$2500 award to the outstanding graduate student conducting research in the area of marine biology and oceanography. The recipient will be selected on the merit of their research proposal as judged by the selection committee and demonstrated financial need. The award may be held once. Apply to Student Financial Services with a one page proposal outlining the area of research interest and a completed Financial Needs Assessment Form by January 10. See ACCESS AWARDS.
Peter Seidl Memorial Scholarship (Zoology)
In memory of Peter Seidl, MSc '80, the Seidl family provides a \$1,000 annual scholarship for a master's student registered in the Department of Zoology. Peter's interest in aquatic sciences led to a career in environmental consulting, working on water quality issues as the Secretary to the Research Council of the Great Lakes, and later, as an environmental specialist for the World Bank, assisting developing countries. Master's students with at least an A- average in the previous two years of full-time or equivalent study registered in the Department of Zoology and in semester 1.0 to 6.0 are eligible. Students must be conducting research related to the quality of wildlife habitat, including fresh and saltwater environments. Apply to the chair, Department of Zoology, by December 1.
College of Physical and Engineering Science Internal Awards
Bruker Canada Limited Graduate Scholarship (GWC)2 (superscript the 2)
This scholarship became available in 1984 and is administered by (GWC)2. It is awarded annually on a competitive basis and is worth \$750. This competition is open to all graduate students registered in the Guelph-Waterloo Centre, provided that their research is in the field of chemical instrumentation. Candidates will be considered on the basis of the quality of a research paper in the field of chemical instrumentation, published or in press, authored or co-authored by the student while registered in (GWC)2. Students may apply for this scholarship directly by writing a letter of application to the director of (GWC)2 and enclosing a copy of their paper. A letter of support from the student's adviser will also be required. The deadline for receipt of applications is June 1 each year and the scholarship will be presented at the annual Saturday seminar of the centre.
A.J. Carty Scholarship (GWC)2
In honour of A.J. Carty, adjunct Professor, Department of Chemistry, University of Waterloo, this \$500 scholarship will be provided annually to a University of Guelph or University of Waterloo graduate student registered at the Guelph-Waterloo Centre for Graduate Work in Chemistry and Biochemistry, (GWC)2. Selection will be based on ability and promise in research and performance in at least two completed graduate courses. Students may hold the award more than once. Students will be nominated by Centre faculty and Graduate Officers by September 18. Nominated students must provide a curriculum vitae and all graduate transcripts and a letter of support from their advisor and, where possible, one other faculty member, to the Director of (GWC)2 by October 1.
December 6th Memorial Graduate Scholarship (Engineering)
This scholarship, established by the University of Guelph Faculty Association, is awarded in memory of the fourteen women murdered in December 1989 at Ecole Polytechnique and is intended to foster women's participation in a profession which is largely comprised of men. This award of \$1,500 is given to a female student who is registered in the Faculty of Graduate Studies and enrolled in the School of Engineering. The recipient will be a Canadian citizen or a permanent resident in Canada. Selection will be based on academic performance. Preference will be given to a student entering the graduate program. Demonstrated financial need may also be considered. Apply to the director, School of Engineering, by September 25.

Danone Crystal Springs Water Resources Engineering Graduate Scholarship (Engineering)

This scholarship was established through the generosity of Danone Crystal Springs, a leading distributor of bottled water. One \$1000 annual scholarship is given to the student entering a Masters or PhD Water Resources Engineering program with the highest entering average in their most recent two years of full-time study and who has a water resources protection research focus. Apply on or before September 15 with completed letter of application outlining the student's current or intended area of research in water resources protection to the Director of the School of Engineering.

Engineering Alumni Scholarship (Engineering)

The School of Engineering Alumni Fund provides a \$500 scholarship to be awarded annually to a student registered in the Faculty of Graduate Studies and enrolled in the School of Engineering. The recipient will be selected on the basis of previous academic performance, curriculum vitae, and letters of reference. Preference will be given to a student entering a PhD program as a new student to the University of Guelph. Apply by October 1 to the director, School of Engineering.

R.G. Goel Scholarship (GWC)2

This scholarship, administered by (GWC)2, is in memory of the late Prof. R.G. Goel and was established from funds donated by Prof. R.G. Goel's friends and colleagues and the Hindu Cultural Society. It is awarded annually on a competitive basis and is worth \$500. This competition is open to all graduate students registered in the Guelph Waterloo centre, provided that their research is in the field of inorganic or organometallic chemistry. Special consideration will be given to those who do not currently hold other major awards. Candidates will be considered on the basis of their academic record and promise in research. The graduate officers of (GWC)2 will bring to the co-ordinating committee the names of all eligible students on each campus of (GWC)2 by June 1 each year and the scholarship will be presented at the annual Saturday seminar of the centre. No application is necessary.

Good Samaritan Graduate Scholarship in Chemistry and Biochemistry (Chemistry and Biochemistry)

An award of \$500 is provided each fall semester to an MSc or PhD student registered in a program at Guelph in the Department of Chemistry and Biochemistry. The award may be held more than once but not with any other scholarship in the same semester. The award is limited to the first six semesters for a MSc candidate and the first nine semesters for a PhD candidate. The selection will be based on the candidate having at least an 'A-' average in the previous two years of study and on the research performance to date. No application is required.

(GWC)2 Seminar Prize (GWC)2

This prize is administered by (GWC)2. It is awarded annually to a student on each campus of the centre and is worth \$100. This competition is open to any graduate student who presented an MSc or PhD seminar in the previous academic year. The graduate officers of (GWC)2 will bring forward nominations to the co-ordinating committee by September 1 each year and the prizes will be presented at the annual Saturday seminar of the centre. No application is necessary.

David Holden Memorial Scholarship (GWC)2

In honour of the late Prof. D.A. Holden, friends, family and colleagues have established a \$500 scholarship to be awarded annually to an outstanding graduate student currently enrolled in the Guelph-Waterloo centre. Candidates must demonstrate strong overall abilities in both teaching and research, outstanding performance in MSc Seminar, 1907940 or PhD Seminar, 1907950, and breadth of interest in areas outside chemistry, such as art and music. Apply before June 1 to the Guelph-Waterloo centre.

Charles S. Humphrey Scholarship (GWC)2

The scholarship is administered by (GWC)2 and is awarded annually on a competitive basis. The monetary value of this award is \$5,000 subject to the availability of funds. This competition is open to Canadian citizens who are registered in a full-time PhD program in the centre, preferably in organic chemistry. Candidates will be considered on the basis of their academic record. The graduate officers of (GWC)2 will bring to the co-ordinating committee the names of all eligible students on each campus of (GWC)2 by June 1 each year and the scholarship will be presented at the annual Saturday seminar of the centre. No application is necessary.

F.W. Karasek Scholarship

This \$500 scholarship will be provided annually to a University of Guelph or University of Waterloo graduate student registered at the Guelph-Waterloo Centre for Graduate Work in Chemistry and Biochemistry, (GWC)2. Selection will be based on ability and promise in research and performance in at least two completed graduate courses. Students may hold the award more than once. Students will be nominated by The Centre faculty and Graduate Officers by September 18. Nominated students must provide a curriculum vitae, all graduate transcripts, a letter of support from their advisor and, where possible, one other faculty member, to the Director of (GWC)2 by October 1.

R.H.F. Manske Prize (GWC)2

This scholarship is administered by (GWC)2. It is awarded annually on a competitive basis and is worth \$500. This competition is open to all graduate students registered in the Guelph-Waterloo centre and special consideration will be given to those who do not currently hold other major awards. Candidates will be considered on the basis of their academic record and promise in research. The graduate officers of (GWC)2 will bring to the co-ordinating committee the names of all eligible students on each campus of (GWC)2 by June 1 each year and the scholarship will be presented at the annual Saturday seminar of the centre. No application is necessary.

Mathematics Graduate Scholarship (Mathematics and Statistics)

The Department of Mathematics and Statistics has established an annual award of \$500 to be given to a graduate student who is registered in the Faculty of Graduate Studies and enrolled in the mathematics graduate program. The recipient will have an overall first-class ('A') average in graduate courses and have the highest average across any three departmental core graduate courses. A student will be considered for the award once only. No application is necessary.

Lana McLaren/Richard Reynolds Memorial Scholarship (Engineering)

Family, friends and colleagues of Lana McLaren and Richard Reynolds have provided \$1,000 for an annual scholarship. Applicants must be entering any graduate program in the School of Engineering or completing the final degree requirements for their BSc(Eng). The recipient will have maintained a well-rounded academic career and demonstrated added value to the profession of engineering. Preference will be given to Canadian citizens and permanent residents of Canada. Apply to the director, School of Engineering, by August 1.

H.G. McLeod Scholarship (GWC)2

In honour of H.G. McLeod, Professor Emeritus and Adjunct Professor, Department of Chemistry, University of Waterloo, this \$500 scholarship will be provided annually to a University of Guelph or University of Waterloo graduate student registered at the Guelph-Waterloo Centre for Graduate Work in Chemistry and Biochemistry, (GWC)2. Selection will be based on ability and promise in research and performance in at least two completed graduate courses. Students may hold the award more than once. Students will be nominated by Centre faculty and Graduate Officers by September 18. Nominated students must provide a curriculum vitae and all graduate transcripts and a letter of support from their advisor and, where possible, one other faculty member, to the Director of (GWC)2 by October 1.

McNeil Graduate Scholarship Award in Natural Products Chemistry (GWC)2

The McNeil Graduate Scholarship Award in Natural Products Chemistry is available to a full-time graduate student registered in the Ph.D. program of the Guelph-Waterloo Centre for Graduate Work in Chemistry and Biochemistry (GWC)2, provided that the research lies in the area of structural elucidation/synthesis of biologically significant compounds. The value of the award is \$1,500 annually. Nominations will be solicited from the (GWC)2 faculty and the Graduate Officers by the deadline date each year. The coordinating committee of (GWC)2, or a subcommittee thereof appointed by the Director, to include a representative from McNeil Consumer Products Company, will make the selection of the award winner.

Merck Frosst Biochemistry Award (GWC)2

A \$500 scholarship will be awarded annually. All graduate students currently registered at the Guelph-Waterloo Centre for Graduate Work in Chemistry and Biochemistry (GWC)2, are eligible provided that their research is in the field of biochemistry. The awardee shall be selected on the basis of his/her performance in at least two graduate courses, with particular emphasis being placed on the former. Nominations will be solicited from the (GWC)2 faculty and the Graduate Officers by the deadline date each year. The coordinating committee of (GWC)2, or a subcommittee thereof appointed by the Director, will make the selection of the award winner.

Mr. and Mrs. William Parker Scholarship (Engineering)

The scholarship was established by Ruth Mary Parker in memory of Mr. and Mrs. William Parker of William Parker Construction Ltd., Guelph, and is valued at \$750 per year. Applicants must be Canadian citizens and full-time graduate students in the School of Engineering. Preference will be given to students entering the PhD program, who are new to the University of Guelph. Apply by letter to the director, School of Engineering, by August 1 and include a curriculum vitae, university transcripts and two letters of reference.

Jack Pos Scholarship (Engineering)

In honour of Professor Jack Pos, a faculty member in the School of Engineering in OAC from 1949 to 1986, the Agricultural Mechanization Club and his family provide a scholarship of \$100 for a student who has graduated from the BSc (Eng) program at the University of Guelph and who is enrolled full-time in an MSc program in biological or agricultural engineering. Preference will be given to Canadian citizens or permanent residents in Canada. Apply to the director, School of Engineering, by August 1; applications must include a curriculum vitae, transcript and two letters of reference.

P.H. Southwell Research Travel Grants (Engineering)
Four \$500 awards will be made annually to students conducting research in agricultural, biological, food or water resources engineering and who will be travelling to a conference where they will present the results of their research. The awards may be held more than once. Apply by letter, with an abstract of the paper, to the director, School of Engineering, by August 1.
Statistics Graduate Scholarship (Mathematics and Statistics)
The Department of Mathematics and Statistics has established an annual award of \$500 to be given to a graduate student who is registered in the Faculty of Graduate Studies and enrolled in the statistics graduate program. The recipient will have an overall first-class ('A') average in graduate courses and have the highest average across any three departmental core graduate courses. A student will be considered for the award once only. No application is necessary.
The W.C. Wood Scholarship (Engineering)
The W.C. Wood Education Trust provides an annual award of \$1,200 to an entering or in-course student conducting research on the preservation of food or on the conservation of the natural resources base for food production. The award may be held more than once. Apply to the director, School of Engineering, by August 1.
Harry Zimmerman Memorial Scholarship in GWC2
The estate of Harry Zimmerman, with the aid of the Ontario government's OSOTF program, provides an annual \$3,000 scholarship to an outstanding PhD student in GWC2 with demonstrated financial need, and who is not beyond the 36th month of doctoral study. Selection from the pool of eligible applicants will be on the basis of ability and promise in research and performance in courses, with at least two graduate courses completed in the PhD program. Preference will be given to students undertaking research in applied chemistry and then to research in an area of direct relevance to industrial chemistry. If no PhD student is eligible, an MSc student may be considered. Students may hold the award more than once. In even years the award will go to a University of Guelph student; in odd years, to a University of Waterloo student. Students should determine their eligibility by January 10 by completing a Needs Assessment Form available from Student Financial Services at the University of Guelph. Subsequently, by February 15, any student deemed eligible should ask a faculty member knowledgeable with the student's research ability to nominate him or her by providing a letter of recommendation, together with a curriculum vitae, a publication list and the academic record of the student to the Director of GWC2. The selection committee is the coordinating committee of the joint graduate program or a sub-committee appointed by the director. See ACCESS AWARDS.

College of Social and Applied Human Sciences Internal Awards

Alumni Research Travel Grants (ECON, GEOG, POLS, PSYC, SOCA)
The University of Guelph Alma Mater Fund provides an endowment for travel awards to graduate students in the Departments of Economics, Geography, Political Science, Psychology, Sociology and Anthropology completing thesis research off campus. Registered students with at least an A- average in the most recently completed two years of undergraduate and/or graduate study are eligible to apply; students cannot receive the award beyond semester 5 at the graduate level. Students submit the application to the graduate co-ordinator of their program of study (application forms are available from graduate co-ordinators and in the Dean's Office, CSAHS) on or before March 1. Selection of award winner(s) will be on the basis of academic achievement and thesis research description.
The Richard Barham Graduate Medal (CSAHS)
In recognition of the outstanding contributions of Professor Richard Barham, Dean of the College of Family and Consumer Studies 1983-1994, a medal is awarded annually to the College of Social and Applied Human Sciences' nominee for the Governor General's medal for outstanding academic achievement at the Master's level of study at the University of Guelph. Application not required.
Katherine M. Beck Memorial Doctoral Scholarship (FRAN, MCS, HTM)
The Estate of Katherine M. Beck, a Mac '22 graduate and chief dietitian at Creelman Hall from 1926 to 1962, provides for one \$10,000 scholarship, payable over two years in installments of \$5000, to a student entering a doctoral program in the Departments of Family Relations and Applied Nutrition or Marketing and Consumer Studies or the School of HTM. The award winner will be selected on the basis of outstanding academic achievement at the undergraduate and Masters level and the potential for significant contributions to the discipline as a doctoral student. No application is necessary.

Katherine M. Beck Memorial Graduate Scholarship (MCS, FRAN, HTM)
The Estate of Katherine M. Beck, a Mac '22 graduate and chief dietitian at Creelman Hall from 1926-1962, provides for three \$5,000 scholarships to students entering a Masters program in the Departments of Family Relations and Applied Nutrition, Marketing and Consumer Studies and HTM (residential program only). The award winners, one from each of the Departments of Family Relations and Applied Nutrition and Marketing and Consumer Studies and the School of HTM will be selected on the basis of outstanding academic achievement. No application is necessary.
Wilda M. Blacklock Award (SOCA)
An award of \$1,000 will be made to the most deserving graduate student on the basis of academic performance in the Sociology and Anthropology graduate program, performance of other graduate student responsibilities and, where decisive, need. Application is not necessary.
Dorothy Britton Memorial Doctoral Scholarship (MCS, FRAN, HTM)
A scholarship of \$14,000 will be awarded annually in memory of Dorothy Britton, a graduate of the Macdonald Institute in 1939. The award will be granted on the basis of high academic achievement. While preference will be given to a student commencing a PhD program in Family Relations and Applied Nutrition, Marketing and Consumer Studies or Hospitality and Tourism Management, all in-course doctoral students in these programs are eligible for the award. No application is required.
Dorothy Britton Memorial Graduate Awards (MCS, FRAN, HTM)
Up to ten awards valued at \$1,500 each are available annually in memory of Dorothy Britton, a graduate of the Macdonald Institute in 1939, to students registered in the Faculty of Graduate Studies and enrolled in Family Relations and Applied Nutrition, Marketing and Consumer Studies, and Hospitality and Tourism Management. The recipients will be selected on the basis of academic achievement. Preference will be given to students entering a graduate program. No application is necessary.
Dorothy Britton Memorial Graduate Scholarship (MCS, FRAN, HTM)
Several awards valued at \$4,000 each are available annually in memory of Dorothy Britton, a graduate of the Macdonald Institute in 1939, to students registered in the Faculty of Graduate Studies and enrolled in Family Relations and Applied Nutrition, Marketing and Consumer Studies, and Hospitality and Tourism Management. The recipient will be selected on basis of academic achievement. Preference will be given to students entering a graduate program. No application is required.
Beatrice Craven Graduate Scholarship (MCS, FRAN, HTM)
This annual graduate award of \$1,000 is to be given to a student entering a graduate program in Family Relations and Applied Nutrition, Marketing and Consumer Studies and Hospitality and Tourism Management. Selection is based on outstanding academic performance at the undergraduate level for MSc entry or at the master's level for PhD entry. The award is tenable with other Senate awards. Application should be made to the chair graduate awards subcommittee, College of Social and Applied Human Sciences before April 1.
Department of Economics Graduate Scholarships (ECON)
Friends of the Department of Economics, with the aid of the Ontario government's OSOTF program, have created seven scholarships of \$500 each to entering or in-course graduate students with a demonstrated financial need who have a minimum application of cumulative in-course average of 75%. Selection will be made based on academic achievement. Apply by letter with a completed Needs Assessment Form to Student Financial Services by January 10. See ACCESS AWARDS.
Department of Psychology Memorial Scholarship (PSYC)
The Department of Psychology, to honour the memory of colleagues, including graduate students (Maury Getkate, Melinda Hamilton, Shawn McFadden), staff (Petra Zimmerman), and faculty (Peter Duda, David Piggins, Victor Lotter, Dennis Stott), provides one \$500 scholarship to a doctoral student who has completed at least three semesters and who has demonstrated the highest level of academic excellence and research activity. No application is necessary; the winner will be selected on the basis of nominations by the advisor of the student's research.
Joan Doherty Memorial Graduate Scholarship (MCS)
The family of Joan Doherty has established a scholarship of \$2,000 to be awarded annually to a member of the graduating class in Marketing and Consumer Studies who will be continuing study at the master's or doctoral degree level in a Canadian university. The scholarship recipient will be determined on the basis of academic promise as evidenced by undergraduate academic achievement. Should equally qualified students make application, preference will be given to previous winners of the Joan Doherty Memorial Undergraduate Scholarship. Application, accompanied by a one-page written statement indicating the student's purpose, goals and objectives in pursuing graduate study, must be submitted to the graduate coordinator, Department of Marketing and Consumer Studies, by April 1.

Joan Doherty Travel Scholarship (MCS)

In memory of the late Joan Doherty (a member of the class of FACS '78), a travel scholarship totalling \$400 will be provided annually to an undergraduate or graduate student in Consumer Studies who has at least a cumulative 70% average. This award will allow students to attend conferences related to their studies and will go toward the cost of attending. Apply to the Chair of the Department of Marketing and Consumer Studies by March 1, including a budget and a description of the travel. The recipient will be selected based upon the cost of attending the conference and the benefit it will bring to the student's program of study.

Joanne Duncan-Robinson Conference Research Travel Grants (SOCA)

In memory of Joanne Duncan-Robinson, an expert in computer and statistical analysis who contributed tremendously to the research activities of faculty and graduate students in the Department of Sociology and Anthropology a \$400 travel award will be made. This award is intended to provide at least partial funding for a graduate student in the Department of Sociology and Anthropology who has had a paper accepted for presentation at a scholarly conference. Students must apply in writing to the Chair of the Graduate Affairs Committee of the Department of Sociology and Anthropology by April 1.

O.P. Dwivedi Graduate Prize for International Development (CSAHS)

A \$1,000 graduation prize will be awarded annually to an outstanding student who must have completed all requirements for their graduate degree at the University of Guelph. Candidates will be considered on the basis of both their overall scholastic achievements and of the practical and social significance of the MA, MSc, MBA or PhD research, which apply social science theory and/or method to the study of development, administration or environmental issues in the Third World. Application is not necessary.

Economics Alumni Masters Scholarship (ECON)

The Department of Economics, with the generous support of Alumni and friends, provides one \$500 scholarship to a full-time graduate student registered in the MA program in Economics. The award will be granted to the student who has attained the highest cumulative average in the first two semesters of the graduate program. No application is necessary.

Founders' Graduate Scholarships (ECON, GEOG, POLS, PSYC, SOCA)

The Alma Mater Fund, alumni and faculty of the former College of Social Science provide up to 10 scholarships of \$1,000 each to students of high academic standing entering graduate programs in the Departments of Economics, Geography, Political Science, Psychology, Sociology and Anthropology. These scholarships recognize the contributions made by the faculty members who founded the College of Social Science. Application is not necessary.

GCORI Graduate Scholarship in Industrial Organizational Psychology (PSYC)

The scholarship is awarded to a PhD student beyond 2nd year of Industrial Organizational Psychology. Selection will be assessed based on applicants' overall cumulative average, the amount of hours worked at Organization & Management Solutions (OMS), achievements and potential contributions to Industrial Organizational Psychology. If there is no outstanding submission, no prize will be awarded. Apply by September 1 to the Department of Psychology Awards Committee with a 1,000-word essay outlining hours worked at Organizational & Management Solutions (OMS), and stating achievements and potential contributions to Industrial Organizational Psychology.

Bill Graf International Development Field Research Grant (POLS)

In memory of Bill Graf, former Professor and Chair of the Department, who devoted his career to the study and teaching of development issues, the Department of Political Science, with the assistance of the Ontario Government's OSOTF program, provides one field research grant of \$1,000 to a graduate student in political science with a focus on international development with at least a minimum B+ (77%) average. Students who have completed the first semester of their M.A. program may apply to Student Financial Services by January 10. Applications must be accompanied by a completed Needs Assessment Form, an approved thesis proposal including details of the proposed field research plan, and a statement of interest in and demonstrated commitment to development issues. See ACCESS AWARDS.

Elena Grothier Memorial Scholarship (MCS, FRAN)

The late Elena Grothier, Macdonald Institute Class of 1915, established a trust fund to provide an annual scholarship of \$1,200 for graduate students in the Departments of Family Relations and Applied Nutrition or Marketing and Consumer Studies. The scholarship will be granted on the basis of high academic proficiency. Applicants must be Canadian citizens or permanent residents. Preference will be given to students commencing full-time graduate study at either the master's or doctoral level. Applications should be submitted to the Chair of the Graduate Awards subcommittee, College of Social and Applied Human Sciences, by April 1.

Alf and Mary Hales Graduate Scholarships in Family Studies (FRAN)

To attract high quality students with an ability to contribute to the University of Guelph's stature in the scientific study of Applied Human Nutrition and Family Studies, Alf and Mary Hales with the aid of the Ontario Government's OSOTF program, have established a scholarship totalling \$3,000 available to the most outstanding applicant(s) to a graduate program in Family Relations and Applied Nutrition who has demonstrated financial need. The award is open to all incoming graduate students in Family Relations and Applied Nutrition. Normally only one award of \$3,000 will be granted; however, if a number of very good applications are received, the award may be divided, but is not to exceed three awards. Apply by letter accompanied by a completed Needs Assessment Form to Student Financial Services by April 1. See ACCESS AWARDS.

Alf and Mary Hales Graduate Scholarship in Political Studies (POLS)

Alf and Mary Hales, with the aid of the Ontario government's OSOTF program, have established a \$1,000 scholarship available to a graduate student in Political Science who has demonstrated financial need. The award will be given to the eligible applicant with the most promising thesis proposal in Political Science. Students in their second semester of graduate work who have obtained a minimum of 80% in all Political Science courses should apply by letter accompanied by a completed Needs Assessment Form and a copy of the thesis proposal to Student Financial Services by January 10. See ACCESS AWARDS.

Harshman Graduate Scholarship (FRAN, MCS)

The H.H. Harshman Foundation provides three awards of \$7,000 to graduate students in the Departments of Family Relations and Applied Nutrition and Marketing and Consumer Studies who intend to be enrolled full-time for three consecutive semesters and whose research is related to the strengthening of the family unit in Canada. The award winner will be chosen on the basis of outstanding academic achievement and demonstrated leadership. Apply to the Chair of the CSAHS Graduate Awards Sub-committee by April 1st including a statement of up to two pages that indicates the following: 1) how the applicant's proposed research is devoted to the strengthening of the family unit in Canada; and 2) evidence of leadership.

H.H. Harshman Foundation Doctoral Scholarship (CSAHS)

The H.H. Harshman Foundation provides one award of \$13,000, payable over 2 years, to a full-time student entering or enrolled in any PhD program in the College of Social and Applied Human Sciences whose proposed research is devoted to the strengthening of the family unit in Canada. The award winner will be chosen on the basis of outstanding academic achievement and demonstrated leadership. Preference will be given to an entering student. Apply to the Chair of the CSAHS Graduate Awards Sub-Committee by April 1, including a statement of up to two pages that indicates the following: 1) how the applicant's proposed research is devoted to the strengthening of the family unit in Canada; and 2) evidence of leadership.

Margaret Hedley Graduate Scholarship in Applied Nutrition (MAN)

Established in honour of Margaret Hedley upon her retirement as the founding coordinator of the Master of Applied Nutrition program. This annual scholarship of \$1,000 will be given to a student entering the MAN program. The award winner will be chosen on the basis of academic achievement and a demonstrated passion for improving nutritional health. This will be assessed during the application interview. No application is necessary.

Kim Prize (SOCA)

In memory of the late Sook-Hee, Jean and Ian Kim, the Department of Sociology and Anthropology offers a \$200 prize to the individual student in the department who has presented the outstanding graduate major paper or graduate thesis during the previous academic year. Application is not necessary.

Ina M. Kniep (nee Carthew) Memorial Graduate Scholarship (FRAN)

The estate of Ina M. Kniep, a Mac '36 graduate who was a specialist in Home Economics and Nutrition and had a lifelong interest and involvement in the University of Guelph, provides for one \$1,750 scholarship to a graduate student registered in either the MSc or PhD program in Applied Human Nutrition. This award will be granted on the basis of outstanding academic performance. No application is necessary.

David Knight Graduate Scholarship (ECON, GEOG, POLS, PSYC, SOCA)

Alumni of the College of Social Science, Alumni of the College of Social and Applied Human Sciences and Professor Alun Joseph, with the assistance of the Ontario government's OSOTF program, have established the David Knight Graduate Scholarship in the amount of \$1,000. The scholarship honours Professor Knight's years of outstanding leadership as Dean of the College of Social Science in the period immediately preceding its amalgamation into the College of Social and Applied Human Sciences. The scholarship is intended for a graduate student in the CIDS program who is entering the second or subsequent semester of a Masters Degree program in the departments of Economics, Geography, Political Science, Psychology, or Sociology and Anthropology. Selection will be based on financial need and a minimum 75% average. Applicants must submit a letter indicating their desire to be considered for the award and a completed Needs Assessment Form to Student Financial Services by January 10. See ACCESS AWARDS.

MAC-FACS Alumni Association Alumnus Graduate Scholarship (MCS, FRAN, HTM)
The Mac-FACS Alumni Association provides one \$500 award to a full-time graduate student who has completed an undergraduate degree in the Departments of Family Relations and Applied Nutrition or Marketing and Consumer Studies or the School of Hospitality and Tourism Management and is entering the MSc or residential MBA program offered by one of these units. No application is necessary.
MAC-FACS Alumni Graduate Scholarship - Marketing and Consumer Studies (MCS)
The Mac-FACS Alumni Association provides one \$1,000 award to a full-time graduate student entering a graduate program in the Department of Marketing and Consumer Studies who has demonstrated high academic achievement. No application is necessary.
MAC-FACS Alumni Graduate Scholarship - Family Relations and Applied Nutrition (FRAN)
The Mac-FACS Alumni Association provides one \$1,000 award to a full-time graduate student entering a graduate program in the Department of Family Relations and Applied Nutrition who has demonstrated high academic achievement. No application is necessary.
MAC '38 Gerontology Graduate Scholarships (FRAN)
Three annual scholarships of \$2,000 each, tenable with other Senate awards, are awarded to full-time graduate students with high academic standing, in the Department of Family Relations and Applied Nutrition, who are pursuing study and research in the field of social gerontology. For one of the awards, preference will be given to a student commencing graduate study. No application is necessary.
Louise McConkey Research Travel Grants (MCS)
In memory of the late Louise McConkey, Mac '27, one or more travel scholarships will be provided annually to defray travel costs related to the student's course of study to undergraduate or graduate students in the Department of Marketing and Consumer Studies with a minimum 70% cumulative average in the last two full time equivalent semesters. The recipient will be selected on the basis of the value of the travel to the students' studies. Apply to the Chair of the Department of Marketing and Consumer Studies including a budget and a description of the travel and the benefit to be gained.
Margaret S. McCready Memorial Scholarship (MCS, FRAN)
The estate of Margaret S. McCready, former Principal and Dean of Macdonald Institute (1949-69), provides for one scholarship of \$1,750 payable over two years to a full-time graduate student registered in an M.Sc. program in the Departments of Family Relations and Applied Nutrition or Marketing and Consumer Studies. The award will be granted on the basis of high academic achievement and leadership ability as demonstrated through extracurricular involvement. Applications should be submitted to the Chair of the CSAHS Graduate Awards Committee, Dean's Office by April 1, including a comprehensive listing of the student's extracurricular activities over the preceding two years.
Margaret S. McCready Scholarship (MCS, FRAN, HTM)
The MAC-FACS Alumni Association has established the Margaret S. McCready Scholarship in honour of the former dean of the Macdonald Institute. The scholarship, valued at \$2,000, is awarded annually to one graduate student or may be divided equally between two graduate students of high academic achievement and professional potential in Marketing and Consumer Studies, Family Relations and Applied Nutrition, or Hospitality and Tourism Management. Apply to the Chair of the Graduate Awards Subcommittee, College of Social and Applied Human Sciences, by April 1. Applicants must enroll as full-time students.
Kiyoko Miyanishi Graduate Geography Scholarship
Dr. Kiyoko Miyanishi, a faculty member in the Department of Geography since 1986, provides two \$1,500 scholarships to international students entering any graduate program (M.A., M.Sc. or Ph.D.) and degree specialization in the Department of Geography. The award will be made on the basis of high academic achievement. In the absence of a qualified international student, the award may be given to an academically-qualified student who is a Canadian citizen or permanent resident. If two deserving students cannot be identified, then one award of \$3,000 will be given out. No application is necessary.
Northwater Capital Management Travel Research Grant in Aging (FRAN)
Northwater Capital Management, with the assistance of the Ontario government's OSOTF program, provides one grant of up to \$900 or two grants of up to \$450 to support travel to conferences for full-time MSc and PhD students in the Family Relations and Human Development and the Applied Human Nutrition Programs. Grants will be made to support the travel costs of students whose proposed paper in the area of gerontology have been accepted for presentation at provincial, national or international conferences. The grant may only be held once. This grant is not available to students registered beyond semester 6 of the master's program or beyond semester 12 of the doctoral program. Apply by January 10 by letter, including a travel budget, accepted paper and a completed Needs Assessment form, to the Chair, Department of Family Relations and Applied Nutrition. See ACCESS AWARDS.

Michael Nightingale Graduate Scholarship (CSAHS)
MAC-FACS alumni, with the assistance of the Ontario government's OSOTF program, has established the Michael Nightingale Graduate Scholarship in the amount of \$1,000. The scholarship honours Professor Nightingale's many years of enlightened leadership as Director of the School of Hotel and Food Administration, Dean of the College of Family and Consumer Studies, and founding Dean of the College of Social and Applied Human Sciences. The scholarship is intended for graduate students who are entering their second or subsequent semester of graduate study in a department within the College of Social and Applied Human Social Sciences. Selection is based on financial need and a minimum 75% average. Applicants must submit a letter indicating their desire to be considered for the award and a completed Needs Assessment Form to Student Financial Services by January 10. See ACCESS AWARDS.
Carol Page-Silim Graduate Scholarship (Family Relations and Applied Nutrition)
A scholarship, the \$200 income of an endowment, is awarded in alternate years to a full-time graduate student in the area of applied human nutrition, who has demonstrated an organized and coherent approach to the conduct of research in this area. No application is necessary for this award, which is tenable with other awards. This scholarship has been established by Dr. A. Silim, in memory of his wife, Carol Page-Silim.
Marion N. Penhale Graduate Research Travel Grant (FRAN)
Two travel awards of up to \$550 per year have been provided by Marion Penhale (MAC'31D) who had over 39 years of involvement in teaching and the foodservice industry, to support travel to conferences for full-time MSc and PhD students in the Family Relations and Applied Nutrition program. Awards will be made to support the travel costs of students whose paper or poster sessions have been accepted at a provincial, national, or international conference which will benefit their studies. The award may be held only once. The award is not available to students registered beyond semester 6 of the master's program or beyond semester 12 of the doctoral program. Apply by April 1, by letter and including a budget, to the Chair, Family Relations and Applied Nutrition.
Gertrude R. Peterson Graduate Memorial Scholarship (FRAN)
One scholarship valued at \$4,500 is to be given annually in memory of Gertrude R. Peterson, a graduate of Macdonald Institute in 1927. Students must be registered in the applied human nutrition graduate program in the College of Social and Applied Human Sciences. Selection will be on the basis of academic achievement. The award is paid over two years, in equal instalments, and the recipient must maintain a first-class ('A') average to continue the award for the second year. Preference will be given to students entering the graduate program at the MSc or PhD level. No application is necessary.
Jean Henderson Sabry Graduate Scholarship (FRAN)
A graduate scholarship established in recognition of Jean H. Sabry by former students and colleagues provides an annual award of \$1,000 to an academically outstanding full-time graduate student enrolled in the Applied Human Nutrition graduate program in Family Relations and Applied Nutrition.. Preference will be given to a student undertaking research in community nutrition or international nutrition. No application is required.
The Mary Singer Research Grant (FRAN)
This is an annual research award from the estate of Mary Singer to a graduate student who is conducting thesis research in gerontology. The award is to cover research expenses up to \$500. No application is necessary.
Starwood Hotels & Resorts Graduate Scholarship (HTM)
Starwood Hotels & Resorts, with the aid of the Ontario government's OSOTF program, provides one scholarship of \$1,500 to a student with demonstrated financial need in a graduate program offered by the School of Hospitality and Tourism Management. To be eligible, graduate students must have successfully completed their first semester of their program with a minimum 70% average. Student must be registered full time in the semester they receive the award. Apply by submitting a completed Needs Assessment Form to Student Financial Services by January 10. See ACCESS AWARDS.
D. Marie Taylor Memorial Scholarship (FRAN)
Mr. James R. Coultres provides one award of \$1,000 to a student entering the Master of Applied Nutrition program in memory of his daughter, Marie, a Mac '69 graduate who dedicated her life to the dietetic profession. The award winner will be chosen on the basis of academic achievement as well as his/her demonstrated advocacy or leadership and commitment to the dietetic profession. Advocacy, leadership and commitment will be assessed by the MAN Admissions Committee during the applicant's admission interview. No application is necessary.
John E. Tong Memorial Award (PSYC)
Faculty in the Department of Psychology, in conjunction with the Tong family, have established an annual graduate thesis award in the amount of \$200, in memory of the late John E. Tong. All graduate students who have successfully defended their MA thesis in any given year from September 1 to August 31 are eligible. The award is tenable with other awards. Application is not necessary.

Koji Victor Ujimoto Graduate Scholarship (SOCA)

Dr. Koji Victor Ujimoto, with the assistance of alumni, friends, colleagues and the Department of Sociology and Anthropology, provides for one \$500 graduate scholarship to encourage applied research on topics of pressing Canadian or global social concern. The award winner will be chosen on the basis of a minimum 80% cumulative average in all graduate courses taken and the quality of his/her major paper or thesis proposal, which must address a contemporary social problem through the application of a Sociological and/or Anthropological perspective. Students should apply to the Chair of the Department of Sociology and Anthropology by March 31, including an outline of their major paper or thesis proposal and the name of the advisor.

Elizabeth M. (Betty) Upton Memorial Research Travel Grant (HTM)

This grant has been established in memory of Elizabeth M. Upton, a faculty member in the School of Hospitality and Tourism Management, who played a key role in the development of the School and was instrumental in the development of the Institutional Foodservice Management major. Up to \$500 is awarded annually to a student who demonstrates the greatest financial need for travel to a University of Guelph recognized study abroad, exchange or letter of permission activity outside Canada, or to attend a relevant professional conference, or to collect research data for a thesis or major paper. Students must have completed two or more semesters in the HTM graduate or undergraduate program, and must be in good academic standing. The project or conference must occur within 12 months. Apply to the HTM Awards Committee with a completed Needs Assessment Form and a letter by April 1 describing the travel, the expected benefit and including a budget and any other expected sources of funding.

The John Vanderkamp Graduate Medal (CSAHS)

A medal is awarded annually to the nominee for the D.F. Forster medal, the most prestigious convocating graduate award at the University of Guelph.

The Leah Mildred Webster Shedden Bursaries (MCS, FRAN)

In memory of Leah Shedden, a 1931 Macdonald Institute graduate in Home Economics, with the aid of the Ontario government's OSOTF program up to seven annual \$1,000 bursaries are awarded. All graduate students in the Departments of Marketing and Consumer Studies or Family Relations and Applied Nutrition with demonstrated financial need, who are in or beyond semester 2 or have completed at least 2.5 credits and have at least a 75% cumulative average in all courses completed to date, are eligible. Apply to Student Financial Services by January 10 with a completed Needs Assessment Form, including information on departmental funding in place for the winter semester. The awards are credited to students' accounts for the winter semester of study. See ACCESS AWARDS.

Yeandle Family In-Course Bursaries (CSAHS)

The Estate of Audrey Yeandle, a Mac '25 graduate and life-long supporter of the University, with the assistance of the Ontario government's OSOTF program, provides several awards of up to \$2,000 each to full-time undergraduate and/or graduate students registered in each of the eight academic units and the Centre for International Development Studies within the College of Social and Applied Human Sciences. Students must apply by October 7 (undergraduate) or January 10 (graduate) to Student Financial Services with a completed University of Guelph Need Assessment Form. Awards will be made on the basis of financial need and academic achievement. See ACCESS AWARDS.

Ontario Agricultural College Internal Awards**Lilian and James Allan Scholarship (Food Science)**

The James N. Allan Family Foundation provide a scholarship of \$2,000 to a student entering the MSc program in Food Science, Food Safety and Quality Assurance. Selection will be based on academic performance and demonstrated financial need. Apply by submitting a letter and a completed University of Guelph Financial Need Assessment Form to Student Financial Services by June 1. This award may be held only once.

Jack Atkin Graduate Scholarship in Horticultural Science (Landscape Architecture)

The Canadian Ornamental Plant Foundation has established a \$1,000 scholarship in recognition of Jack Atkin's many contributions to the industry. It is available to a student entering graduate studies in horticultural science who has demonstrated an interest in horticultural projects such as Arboriculture, plant propagation, flower production or in related areas of interest. Apply to the Chair, Plant Agriculture, by July 1 with a letter indicating interest in horticulture.

Prof. A.W. Baker Memorial Bursaries (OAC)

The estate of Margaret A. MacLean, through a bequest in honour and memory of her father the late Prof. A.W. Baker, Chair of the Department of Entomology, with the aid of the Ontario government's OSOTF program, provides bursaries of up to a total of \$3,000 annually for students with demonstrated financial need who are registered in the Faculty of Graduate Studies who are registered in the Faculty of Graduate Studies and enrolled in a department in the College of Biological Sciences or the Ontario Agricultural College. Full-time or part-time continuing or in-coming MSc students not beyond semester 5 or PhD students not beyond semester 9, studying or conducting research in entomology are eligible. Apply by letter describing research project and research interests accompanied by a curriculum vitae and completed Needs Assessment Form to Student Financial Services by January 10. See ACCESS AWARDS.

Mrs. Fred Ball Scholarships (Plant Agriculture)

An endowment fund has been established through the estate of May Ball in memory of her mother, Mrs. Fred Ball, who had a life-long interest in flowering ornamental plants, particularly roses. The fund provides five annual awards of \$5,000 each. Graduate students in Plant Agriculture with a minimum cumulative standing of 75% in the previous two years are eligible. The recipients will be chosen on the basis of academic achievement and/or the quality of their graduate research. Apply to the chair, Department of Plant Agriculture, by June 1 with a letter outlining research (no more than two pages) and a letter of reference from advisor.

Ball Farm Services Ltd. and Agrico Canada Ltd. Scholarship (Plant Agriculture, Land Resource Science)

A scholarship of \$1500 is provided by Ball Farm Services and Agrico Canada Ltd. to acknowledge their long-standing association. Graduate students in Plant Agriculture or Land Resource Science who are conducting research on sustainable crop production systems and their application to production agriculture are eligible. Academic standing in the previous two years and applied research potential will be used to determine the recipient. Apply to the Dean, OAC, by June 1, with a letter of support regarding research potential.

John Bandeen Memorial Scholarship (Plant Agriculture)

In memory of the late Dr. John Bandeen, a graduate of OAC '57 and a faculty member in the Department of Plant Agriculture, a scholarship of \$1,800 is awarded annually from funds provided by his friends and associates. This award is available to MSc or PhD students who are conducting research in weed science. Apply to the chair, Department of Plant Agriculture, by June 1.

Beaton Scholarship in Dairy Science (Food Science)

In memory of the late Mr. J.L. Beaton of Oshawa, an award of \$2,400 is awarded to a graduate student in the Department of Food Science who is working on a research project directly related to the dairy industry. Preference will be given to students with high academic standing who are entering the MSc program. Apply to the chair, Department of Food Science, by June 1.

Beatty-Munro Family Memorial Scholarship (Apiculture)

Dr. and the late Mrs. J.A. Munro of Springfield, Illinois, have established an endowment fund of \$20,000, the income from which provides an annual award of approximately \$2,500 for a graduate student or a postdoctoral fellow conducting research in the field of apiculture. Apply to the chair, Department of Environmental Biology, by June 1.

Bell-Sargant Scholarship (Landscape Architecture)

This award has been established by William B. Sargant, in honour of Nora Reta Bell and William George Sargant, who celebrated their fiftieth wedding anniversary in 1978. The award of \$2,500 is available to MLA students who are Canadian citizens or permanent residents and who are studying park administration, recreation planning, or resources development or management as related to park development. Selection will be based on academic standing, participation in community and on-campus activities, and interest in park development will be considered. The LA Grad Awards committee will forward a nomination to the OAC awards committee prior to August 1 each year. No application necessary.

David and Carolyn Biesenthal Scholarship (OAC)

A \$5000 scholarship, established through funds in trust in the Biesenthal family name, will be awarded to graduate students in OAC conducting research in water quality. The recipients will be chosen on the basis of academic achievement, based on cumulative average over the previous two years of study, and or the quality of graduate research with an emphasis on the interaction of livestock waste and the environment. Apply by June 1 to the Chair, Department of Land Resource Science with a letter outlining your research.

The Marian Brennan and Hedley Harrison Memorial Scholarship (Plant Agriculture)

This award is provided in memory of Marian Brennan and Captain Hedley M. Harrison. A scholarship of \$500 is awarded annually to a graduate student (MSc or PhD) in horticultural science. Selection will be based on academic performance as evidenced by grade standing (a minimum average of 75%), publications, letters of reference and research potential. Preference will be given to an entering student. Apply by June 1 with a letter of up to two pages in length, an up-to-date Curriculum Vitae, and two letters of reference to the Chair, Plant Agriculture.

Brickstop Corporation Scholarship in Landscape Architecture (Landscape Architecture)

The Brickstop Corporation provides a scholarship of \$1,000 to a graduate student enrolled in the MLA Program who has completed two semesters or more with a minimum of 75% in the previous two semesters. Selection will be based on financial need. Preference will be given to a student who has participated in extracurricular activities. Apply to Student Financial Services by June 1 with a completed Needs Assessment Form and a letter.

Bullick Scholarship in Food Grain Research (Plant Agriculture)

In memory of their parents (John and Annie Wannop of Nanton, Alberta, and William and Mary Bullick of Uttoxeter, Ontario), Rose and Clare Bullick provide an award of \$15,000 for the initial year of study for a full-time student enrolled in the Department of Plant Agriculture who is conducting research on food grains. No application is necessary. Selection will occur prior to August 1.

Harvey W. Caldwell Scholarship (Rural Extension Studies)

This annual award of \$2,400 is tenable with other Senate awards except the OAC Williams and Grothier Scholarships and is awarded to a student who has completed at least two semesters with high academic standing. Preference will be given to a student who has demonstrated interest in the practice of rural extension in Canada. Apply to the graduate coordinator, Rural Extension Studies, by June 1. Donor - Faculty in the Department of Rural Extension Studies.

Canadian Society of Landscape Architects Prize (MLA)

The Canadian Society of Landscape Architects offers a prize of \$500 to a student graduating from the Masters of Landscape Architecture program who has achieved excellence in the study of landscape architecture and has contributed significantly to the University of Guelph landscape architecture program and the profession. No application is required.

Chanasyk Graduate Medal for Professionalism (MLA)

The Chanasyk Graduate Medal is awarded annually to the graduating student in the master of landscape architecture program who, in the view of faculty, is deemed to be the most promising professional practitioner. The decision will be based on the criteria of ethics, altruism, an attitude of stewardship of the land, and progressive educational ideals. Application is not necessary.

Sue Chase and John Steckle Scholarship in Agriculture (Plant Agriculture, Animal and Poultry Science)

In memory of their father and mother (John Steckle and Sue Chase, graduates of OAC '20 and '21 respectively), Jean and Bob Steckle (OAC '52) provide an award of \$2,500 annually to a graduate student in Plant Agriculture or animal and poultry science who is enrolled in an MSc or PhD program. Candidates must have high academic standing, be involved in research related to the interest of the department and have demonstrated an interest in Canadian agriculture. Application is not necessary. The award alternates between the two areas of study, commencing in 1998/99 with Animal and Poultry Science. It is tenable with other Senate awards.

Michael Chepesuik International Research Travel Grant (Agricultural Economics and Business)

In memory of the late Michael W. Chepesuik, OAC '30, this travel grant(s) will be awarded annually to an undergraduate or graduate student pursuing studies in agricultural economics and who is studying outside of Canada for one or more semesters. Eighty percent of the actual travel costs associated with the study outside of Canada program will be covered up to a maximum of \$1,000 per student. Application by letter should be made to the Dean of OAC by April 15, including a description of the study program.

George I. Christie Scholarship (Animal Science)

The late George I. Christie, president of OAC from 1928 to 1945, established a trust fund to provide an annual scholarship of \$1,000 for graduate work. This scholarship is awarded to a student graduating with high standing in an animal and poultry science major who proposes to pursue graduate studies in animal science, at any institution of his or her choice. Applications approved by the chair, Department of Animal and Poultry Science, should be submitted to the OAC dean's office by April 1.

The Class of 1933 Scholarship

In honour of the late Professor W.J. Squirell, the graduating class of OAC 1933 offers a scholarship of \$5000 (or two scholarships of \$2,500 each) to graduating students of the BSc(Agr) program who plan to undertake graduate study in agriculture at a recognized university. Academic standing and involvement in extracurricular activities will be used to determine the recipients. Apply to Student Financial Services by April 1.

W.E. Coates Memorial Scholarship (Landscape Architecture)

An annual scholarship of \$750, tenable with other Senate awards, to a student entering the first year of the MLA program who has demonstrated proficiency in technical skills, scholarship and commitment to the profession. Selection will be by the OAC awards committee on recommendation of the director of the School of Landscape Architecture. The donors are friends of the late William Coates. No application is necessary.

Frank Wallace Cockshutt Scholarship (Animal and Poultry Science)

In 1951 the estate of the late Frank Wallace Cockshutt established an award in the field of dairy cattle breeding. The annual scholarship is \$3,200. The award will be based on academic standing and interest in and aptitude for research in dairy cattle breeding. Apply to the chair, Department of Animal and Poultry Science, by July 1.

Keith R. Collver Scholarship (Food Science, Plant Agriculture)

In recognition of the contributions of Keith R. Collver, a \$1,600 award is provided annually for graduate students in Food Science or Plant Agriculture who are conducting research in postharvest physiology, packing, processing or marketing of fruits and vegetables. The recipient will be conducting research with direct application/benefit to the marketing of fruits and vegetables. Apply to the dean of OAC by June 1.

Kenneth E. Crawford Scholarships (Animal and Poultry Science)

In recognition of 40 years of dedicated service to the Ontario and Canadian turkey industries by Kenneth Crawford, the Ontario Turkey Producers' Marketing Board, the Canadian Turkey Marketing Agency, and the OAC Alumni Foundation, with the aid of the Ontario government's OSOTF program, provide two awards of \$3000 each to MSc and/or PhD students in Animal & Poultry Science who are conducting research in poultry production. Selection will be based on financial need and academic performance. If there are insufficient eligible candidates, graduate students in Agricultural Economics who are conducting research in poultry marketing will be considered. Apply by letter with a completed Needs Assessment Form to Student Financial Services by January 10. See ACCESS AWARDS.

Herbert F. Crown Memorial Scholarship for Conservation and Rural Development (RP&D)

A graduate scholarship of \$900 is awarded annually to an MSc Planning student in Environmental Design and Rural Development based on academic achievement and quality of research in the area of rural development and/or conservation and community development. Funding for this scholarship has been provided by family, friends and associates of the late Herbert F. Crown whose career was spent working in these fields with the Ontario Ministry of Agriculture and Food. Apply with a one-page letter outlining research and academic achievements, to the Director, Environmental Design and Rural Development by April 1.

CSLA Graduate Medal (MLA)

The Canadian Society of Landscape Architects provides a silver medal to a student graduating from the master of landscape architecture program who has maintained a high academic standing and contributed to the school and the profession. Application is not necessary.

Taffy Davison Memorial Research Travel Grants (OAC)

The Taffy Davison Memorial Fund provides financial assistance to students in PhD programs or in the final year of master's programs to attend scientific or professional meetings. Graduate students in any OAC department or school are eligible to apply. Grants of 80% of actual expenses up to a maximum grant of \$500 are awarded. Applications must be submitted by April 1 for meetings to be held between June 1 and November 30, and by October 15 for meetings held during the period of December 1 to May 31. Application forms are available from the OAC Dean's Office, Johnston Hall, Room 162.

<p>The Edmunds, Millen, Ozburn, Peer Scholarship in Entomology/ Apiculture (Environmental Biology)</p> <p>A graduate scholarship of \$3,400 is awarded annually to an MSc or PhD student in entomology or apiculture based on high academic standing and research interests related to apiculture or entomology. Funding for this scholarship has been provided by the friends and associates of the late J.W. Edmunds, OAC '51, apiculturalist; friends and associates of the late F. Eric Millen, apiculturalist; the Ozburn family and friends in memory of Professor R.H. Ozburn, a former faculty member in the OAC Department of Zoology and Entomology; and the family and friends of Don Peer, apiculturalist. The award is made in the memory of these four individuals whose interests in entomology and apiculture were of support to and valued by their colleagues at OAC. No application is necessary; the Department of Environmental Biology will nominate a recipient by June 1 each year.</p>
<p>Farm Managers and Rural Appraisers Award (Agricultural Economics and Business)</p> <p>The Ontario Chapter of the American Society of Farm Managers and Rural Appraisers has made available funds for an annual award of \$1,300. The award is made to encourage research in farm management and rural appraisal. It is available to graduate students in the department who intend to pursue research in these areas. The recipient will be selected at the end of each winter semester. Application is not necessary.</p>
<p>Food Science Department Scholarship (Food Science)</p> <p>The department has established an annual scholarship of \$500 to be awarded to a full-time graduate student in the department. The scholarship will be awarded on the basis of the student's academic record in the previous full academic year. Students who experience difficulty in obtaining other sources of financial support shall be given priority by the selecting committee. Apply to the chair, Department of Food Science, by June 1.</p>
<p>Dr. G.W. Friars Award (Animal and Poultry Science, Plant Agriculture)</p> <p>An annual award of \$400 to an MSc or PhD student registered in the Departments of Animal and Poultry Science or Plant Agriculture and working in the field of quantitative genetics. The award will be based on academic standing, and interest in and aptitude for research in quantitative genetics. Apply to the dean of OAC by June 1.</p>
<p>James Aubrey and Doris Garner Memorial Scholarship (Agricultural Economics)</p> <p>The family of the late James and Doris Garner provides a \$2500 scholarship annually to a student enrolled in Phase II of the Executive MBA program to completion of degree with preference given to a candidate from a family-owned farm. James, a graduate of OAC in 1923, was elected to the Ontario Agricultural Hall of Fame following an exemplary career in the Extension Branch of the Ontario Dept. of Agriculture. In considering the applicants, preference will be given to a student who: (a) has a financial need, (b) has a desire to further the cause of family-owned farms and small-scale agri-business, (c) demonstrates high academic standing. Preference will be given to Canadian citizens. Apply by letter to the Director of the EMBA Program by February 1 including a completed Needs Assessment Form.</p>
<p>Golden Harvest Graduate Scholarship in Agriculture (OAC)</p> <p>A graduate scholarship of \$20,000 annually is provided to support a citizen of the Czech Republic who enrolls in a graduate program at the Master's or PhD level in OAC based on academic standing at the undergraduate level and proficiency in English. Subsequent payments of \$20,000 will be provided in year 2 of the Masters program and years 2 and 3 PhD program pending successful progress. Apply by letter to OAC Dean's Office by June 1.</p>
<p>W.R. Graham Memorial Award (Poultry Science)</p> <p>The award is in memory of the late Dr. W.R. Graham, one of the founders of the Poultry Science Association, pioneer researcher in the Department of Poultry Husbandry from 1899 to 1940. The award, valued at \$1,300 per annum, is open to a deserving graduate student with Canadian citizenship or permanent resident status, studying at Guelph in the area of poultry science. The selection is made by the OAC awards committee following a review of the applications in the Department of Animal and Poultry Science. Apply to the chair, Department of Animal and Poultry Science, by July 1.</p>
<p>Emiel Griesbach Year OAC '30 Scholarship (Department of Food Science)</p> <p>In memory of their classmate Emiel C. Griesbach, OAC '30, the OAC Alumni Foundation provides a scholarship of \$1,000 annually for a student in the department who is entering semesters 1 or 2 of a graduate program. The recipient will have at least a 'B+' standing in the two previous years of study. Apply to the chair, Department of Food Science, by June 1.</p>
<p>Elena Grothier Scholarship in Rural Extension Studies</p> <p>This annual award of \$2,500 is tenable with other Senate awards except the Soden and is presented to an academically outstanding student entering the MSc program in rural extension studies. Application must be made by letter to the Graduate Coordinator, Rural Extension Studies, by June 1. Selection is by the OAC awards committee on the recommendation of the chair of the department. The donor is the Grothier estate.</p>

<p>Alf and Mary Hales Graduate Scholarship in Food Science (Food Science)</p> <p>Alf and Mary Hales, with the aid of the Ontario government's OSOTF program, have established a \$2000 scholarship available to entering M.Sc. students in Food Science who have an interest in Meat Science and who demonstrate financial need. Apply by letter accompanied by a completed Needs Assessment Form to Student Financial Services by April 1. See ACCESS AWARDS.</p>
<p>Robert J. Hall Memorial Poultry Scholarship (Animal and Poultry Science)</p> <p>The \$3000 scholarship commemorates the work of the late Robert Hall, OAC 1936 diploma, and his lifetime devotion to the poultry industry in Ontario. Currently registered full-time graduate students in Animal and Poultry Science or the Ontario Veterinary College, whose research has direct and current application to commercial poultry farming in Ontario and who have a minimum 77% average in the last two years of study, are eligible to apply. First priority is given to students entering or in the first year of study (MSc or PhD or DVSc); preference will be given to Canadian citizens or permanent residents. In exceptional circumstances, based on research relevance, two awards of \$3000 may be given in the annual competition. Apply to Animal and Poultry Science by October 15; the Department will include OVC in reviewing the applications. Selection is by the OAC Awards Committee, on the recommendation of Animal and Poultry Science.</p>
<p>Hamilton Milk Producer's Association Scholarship (Animal Science)</p> <p>The scholarship, the gift of the Hamilton Milk Producer's Association, is based on the income from \$15,000 and is tenable for one year by a graduate student enrolled in the Department of Animal and Poultry Science. The scholarship must be used exclusively for research related to dairy cattle. The award is approximately \$2,000 annually. Apply to the chair, Department of Animal and Poultry Science, by July 1.</p>
<p>James Harris Scholarship (Animal Science)</p> <p>The award, established by the James Harris Foundation, has a value of \$3,000 for two semesters of full-time post-graduate study and research in the Department of Animal and Poultry Science on problems with meat-producing livestock. Apply to the chair, Department of Animal and Poultry Science, no later than July 1.</p>
<p>Ajinomoto Heartland/Halchemix Scholarship (Animal and Poultry Science)</p> <p>Halchemix Canada Inc. has established the Ajinomoto Heartland/Halchemix Scholarship of \$500.00 for a graduate student in Animal and Poultry Science conducting research in the field of amino acids in the nutrition of monogastric livestock. Preference will be given to a Ph.D. candidate. Selection will be made on the basis of merit and financial need. Apply to Student Financial Services with a completed University of Guelph Financial Need Assessment Form, including a brief summary of your research and a letter of support from your advisor by July 1.</p>
<p>Gordon B. Henry Bursaries in Food Science (Food Science)</p> <p>Bursaries in memory of OAC graduate '34 Gordon B. Henry are provided by his family and associates, with the aid of the Ontario government's OSOTF program. These bursaries totalling \$1000 are available to graduate and undergraduate students registered in Food Science. Apply to Student Financial Services by January 10 and include a completed Needs Assessment Form. See ACCESS AWARDS.</p>
<p>Hoskins Scholarships (Plant Agriculture)</p> <p>Two annual scholarships of \$2,500, tenable with other Senate awards, have been established in memory of Mr. F. and Miss G. Hoskins for graduate students with high academic standing who are involved in research related to horticulture. These scholarships are awarded to students who have completed a minimum of two full-time semesters of graduate study and may be held for successive years (PhD only) upon reapplication. Apply to the chair, Department of Plant Agriculture, by June 1.</p>
<p>Hurnik Award in Agricultural Ethics (Animal and Poultry Science)</p> <p>A \$500 award in agricultural ethics is provided by Dr. Frank Hurnik, Professor Emeritus, and faculty member in Animal and Poultry Science from 1971 to 1997. Dr. Hurnik initiated the work in behavioral studies and animal welfare at Guelph, developed the first course in Animal Welfare, and was co-founder and editor of the Journal of Agricultural and Environmental Ethics. OAC students, graduate or undergraduate, who are associated with the department of Animal & Poultry Science and who undertake a project or attend a conference/scientific meeting or publish a paper in animal welfare or agricultural ethics may apply. A minimum of B standing for undergraduate students, and A- standing for graduate students in the last two semesters is required. The award will be given to the student who has the best presentation, paper or project. Apply by letter to the Chair, Animal and Poultry Science, by February 1 outlining the details of the project or meeting.</p>
<p>H.L. Hutt Memorial Scholarship (Plant Agriculture)</p> <p>This is an annual award of \$1,400, tenable with other Senate awards, to a student who is conducting research in horticulture. Academic standing will be used to determine the recipient from those eligible. Apply to chair, Department of Plant Agriculture, by June 1. Selection is by the OAC awards committee upon the recommendation of the chair of the department. Donor - Dr. Fred B. Hutt.</p>

Kasha Scientific Research Travel Grants (Plant Agriculture)
The fund is established to provide financial assistance to graduate students in the Department of Plant Agriculture to attend meetings and present papers on haploidy or biotechnology. A total of \$1,200 per year will be awarded to cover expenses of one or more students. For overseas meetings, the award may be held in conjunction with other travel awards. Preference may be given to students with other travel awards. Preference may be given to students planning to attend an overseas international meeting and who have demonstrated good research potential. Applications should be submitted to the chair, Department of Plant Agriculture, by June 1 for travel during the next calendar year. The fund has been established by professor K.J. Kasha from the 1983 Ernest C. Manning Award that he received in recognition of his research on haploidy in barley.
Brian W. Kennedy Memorial Scholarship (Animal and Poultry Science)
This award was established by family, friends and colleagues in recognition of Dr. Kennedy's dedication to and accomplishments in the fields of animal breeding and genetic teaching and research. A scholarship of \$1,600 will be awarded to an in-course graduate student based on academic standing, extracurricular activities and contributions to the life of the department. Application is by letter, stating interest and qualifications, to the director of Centre for Genetic Improvement of Livestock by July 1.
The Keyes Family Scholarship (Animal and Poultry Science)
This \$1000 scholarship is available to graduate students currently registered full-time in the Department of Animal and Poultry Science who are in their 2nd year of an M.Sc. or Ph.D. program. The scholarship is awarded to a student who has demonstrated: research and academic achievement based on publications, cumulative average and letter from student's advisor-advisory committee and, an interest in animal welfare. Application not necessary. Nominations to be submitted by the Department of Animal and Poultry Science to the OAC Awards Committee Chair by October 7.
Amos Kitchen Memorial Scholarship (Animal & Poultry Science, Agricultural Economics & Business, Plant Agriculture)
In memory of Amos Kitchen, his friends, associates and the Ontario Sheep Marketing Agency, and the OAC Alumni Foundation, with the aid of the Ontario government's OSOTF program, provide an annual scholarship of \$3000 to a graduate student in Animal & Poultry Science, Agricultural Economics & Business or Plant Agriculture who is conducting research in sheep production or marketing. Selection will be based on student's financial need and academic performance to date. Apply by letter with a completed Needs Assessment Form to Student Financial Services by January 10. See ACCESS AWARDS.
Major General LaFleche Memorial Scholarship (Plant Agriculture)
Established by Mr. Noah Torno, President of Jordan Wines, in memory of Major General LaFleche, the scholarship is awarded annually to a graduate student in horticulture with high academic standing. The award, valued at approximately \$1,000 and tenable with other Senate awards, is based upon income from a trust fund. Apply to chair, Department of Plant Agriculture, by June 1.
Land Resource Science Graduate Scholarships (Land Resource Science)
Two or more scholarships of \$2,000 each are provided from the Land Resource Science Endowment Fund to graduate students (MSc or PhD) registered in the department. The funds are provided in recognition or in memory of students, staff and faculty in the department. Students will be selected on the basis of academic standing and contribution to the academic life of the department. No application is required.
Landscape Architecture ACCESS Scholarships (Landscape Architecture)
Faculty members and students in Landscape Architecture, with the aid of the Ontario government's OSOTF program, provide two scholarships of \$500 to graduate or undergraduate students in the School. Students must have demonstrated financial need and a minimum of B standing in the previous academic year. Apply by January 10 to Student Financial Services; include a completed Needs Assessment Form. See ACCESS AWARDS.
Landscape Architecture Alumni Scholarships (MLA)
Alumni of the School of Landscape Architecture provide up to three \$1,000 scholarships annually for students who are registered in the Faculty of Graduate Studies and enrolled in the MLA program and who have completed two semesters. The recipient(s) will be selected on the basis of academic performance and participation and leadership in extracurricular activities. Students, faculty or alumni may nominate eligible students to the School of Landscape Architecture by October 30.
Robert Orr Lawson Scholarships (Food Science)
Five scholarships of \$5,000 are provided by the estate of the late Robert Orr Lawson, a friend of the University. They are available to graduate students who have completed at least one year of study in the Department of Food Science and who have achieved a minimum of an "A-" level standing in course work in their program. Apply to the Chair, Department of Food Science by June 1.

Pearl Lyons Memorial Scholarship (Rural Studies)
Mr. John Lyons has established a scholarship in memory of his mother, Pearl Lyons. This \$20,000 scholarship is available to a graduate student entering the Rural Studies Ph.D. program in the Ontario Agricultural College. The scholarship will be given at \$10,000 per year for the first two years. The second installment is conditional on satisfactory performance during the first year. All students entering the Ph.D. in Rural Studies program will automatically be considered. Selection is based on the assessment of the application package and documents such as transcripts, curriculum vitae, letters of reference, etc. included therein. No application is necessary.
Manton Memorial Scholarship (Plant Agriculture)
An annual award of \$2,500 has been established in memory of George Manton and William Douglas Manton for graduate students in horticulture research with high academic standing. The scholarship is tenable with other awards. Apply to the chair, Department of Plant Agriculture, by June 1.
The Honourable John S. Martin Scholarship (Poultry Science)
In memory of the late Honourable John S. Martin, Port Dover, poultry breeder and Minister of Agriculture for Ontario 1923-1930, this scholarship of approximately \$1,200 is made available to undergraduate or graduate students in poultry science. Eligible graduate students must be studying in the area of poultry science and have high academic standing, as well as participate in extracurricular activities. Apply to the chair, Department of Animal and Poultry Science, before July 1.
W.G. Matthewman Scholarship (OAC)
This \$3,375 scholarship has been established in memory of the late W.G. Matthewman, OAC'34. It is awarded to a student who has received a B.Sc. degree from the University of Guelph and is entering, in the current fall semester or has entered in the previous winter or spring semester, the M.Sc. program with a study interest relating to entomology. Selection will be based on experience in the area of entomology through previous work or work experience and academic standing as evidenced by the application to the program. No application is required.
Dr. O.M. McConkey Scholarship (Plant Agriculture)
A \$13,500 scholarship has been established by the late Dr. O.M. McConkey, a professor in the Department of Plant Agriculture and a pioneer in grassland research and conservation. Graduate students in the M.Sc. or Ph.D. programs in the Department of Plant Agriculture working in the area of crop breeding and genetics, physiology and management or biotechnology are eligible. Selection will be based on an assessment of research potential, area of research, and academic standing. Preference will be given to students conducting research in the area of forage crops and conservation. All graduate students in the M.Sc. or Ph.D. programs in Plant Agriculture will be considered for this award. The graduate application along with student advisor recommendations will be used for this assessment.
F.L. McEwen Award (OAC)
In recognition of F.L. McEwen's contribution as Dean of OAC (1983-90), the OAC Alumni Foundation provides an award of \$4,000, given to an OAC graduate on entry to a graduate program in a department or school in OAC. Applicants should outline the relationship of their research interests to sustainable agriculture and their extracurricular activities in this area. Apply by letter to the OAC dean's office by April 1.
Ted McGrail Memorial Scholarship (OAC)
In memory of Ted McGrail, past chairman of the Ontario Soybean Growers, his family and the board provide an annual scholarship of \$2,000 for students enrolled in a MSc program in the Departments of Agricultural Economics and Business, Animal and Poultry Science, Plant Agriculture, Environmental Biology, Food Science or Land Resource Science who are conducting research on some aspect of soybean production, breeding, marketing or processing. The recipient will be selected on the basis of high academic achievement. Apply to the dean of OAC by June 1.
James A. McGrath Memorial Scholarship (Poultry Science)
Established by friends of the late James McGrath, an award valued at \$2,500 per annum is awarded to an outstanding graduate student in poultry science, preference being given to those intending to follow a career in the poultry industry in Canada. Apply to the chair, Department of Animal and Poultry Science, by July 1.
J. Alden and Isobelle McLean Scholarship (OAC)
A scholarship of \$2,300 is made available by the family of the late Alden and Isobelle McLean to support students who are entering the area of Rural Extension Studies, the School of Rural Planning and Development or the Rural Studies doctoral program, and who will be conducting research in rural community development. Apply to the dean of OAC by June 1.

Dan McMillan Graduate Bursaries in Food Science (Food Science)

The Dan McMillan Bursaries are provided from the estate of Dan McMillan, OAC 1940, in memory of his father and by the government of Ontario through the OSOTF program. Three or more bursaries valued at up to \$4,000 each are awarded to graduate students in Food Science on the basis of financial need. Students must be progressing satisfactorily. Apply to Student Financial Services with a completed Needs Assessment Form by January 10. See ACCESS AWARDS.

The Larry Milligan Research Travel Grant (Animal and Poultry Science)

Family, friends and colleagues established this research travel grant at the conclusion of Dr. Milligan's term as vice-president, research in 2001 to recognise his sixteen years of leadership of research activities. The grant is awarded to a graduate student in the Animal and Poultry Science program to assist in attendance at conferences for the presentation of research findings. The \$2000 grant is awarded to a masters or doctoral student on the basis of academic excellence. Students should submit a curriculum vitae, a one-page summary of research, a list of scholarly publications, a transcript of their academic record, and a one-page travel plan by April 30 to Student Financial Services.

Monsanto Turfgrass Research Scholarship (OAC)

Monsanto Canada Inc. provides an annual award of \$2,000 to an outstanding graduate student enrolled in the Departments of Plant Agriculture, Environmental Biology, or Land Resource Science who is conducting research in turfgrass science or management. Apply to the director, Guelph Turfgrass Institute, by June 1.

George W. and Mildred B. Moore Scholarship (Rural Extension Studies)

In memory of the late Rev. Dr. George W. Moore and the late Mildred Baker Moore, an award of \$1,000 is made to the student in the MSc program in the area of Rural Extension Studies who obtains the highest academic standing in the first year of study and whose work involves distance education applications of communication technology in rural and remote communities. Application is not necessary.

Morwick Scholarship (Land Resource Science)

The family of the late Professor Frank F. Morwick (OAC '27) faculty member of the Department of Land Resource Science for 35 years, and his wife, the late Lorraine (Ferguson) Morwick (Mac '28), offers a scholarship of \$1,600 to a student enrolled in a graduate program related to land resource science. The student must have demonstrated an outstanding academic ability (in both coursework and research), qualities of leadership and understanding. The recipient will be expected to have contributed to and participated in all phases of departmental activities. The research will contribute to a fuller understanding for the planning and use of land resources. No application is necessary.

Ronald C. Moyer Scholarship (Plant Agriculture)

The Ontario Grape Grower's Marketing Board has established a scholarship of \$2,000 to be awarded to an MSc and PhD student in Plant Agriculture who is conducting research in viticulture, oenology or both. Academic standing in the previous two semesters will be used to determine the recipient from among eligible applicants. Recipients of the scholarship are eligible to apply in subsequent years and will be considered in open competition with other applicants. The scholarship is awarded on recommendation of the chair of the Department of Plant Agriculture to the OAC awards committee. No application is necessary.

Kenneth G. Murray Scholarship (OAC)

In recognition of the work of Ken Murray, OAC '50, an award of \$1,500 is provided by J. M. Schneider Inc. and is presented to a graduate student with a minimum first-class ('A') average, who is enrolled in one of the Departments of Agricultural Economics and Business, Animal and Poultry Science, Plant Agriculture, Food Science, Environmental Biology or Land Resource Science. No application is necessary.

OAC 1950 International Research Travel Grant (OAC)

The Class of OAC 1950, with the aid of the Ontario government's OSOTF program, provides annual travel grants of 80% of the cost of travel to/from the site of research/study up to a maximum of \$1000 per student. The grants are intended to encourage graduate students with demonstrated financial need in any department or school of OAC to participate in study/research activities at laboratories and institutions outside Canada. Students who are completing MSc programs in Rural Extension Studies or Rural Planning and Development and who are undertaking an internship program with the Food and Agriculture Organisation (FAO) (Rome) may also apply for a grant of \$3,000 to cover the travel and accommodation costs associated with their internship. Apply by letter to Student Financial Services by April 1 outlining the proposed program of study or research. Include a letter of support from the student's advisor, a budget and a completed Needs Assessment Form. See ACCESS AWARDS.

OAC 1950 International Travel Research Grant(s) (OAC)

The Class of OAC 1950, with the aid of the Ontario government's OSOTF program, provides annual travel grants of 80% of the cost of travel to/from the site of research/study up to a maximum of \$1000 per student to encourage graduate students with demonstrated financial need in any department or school in OAC to participate in study/research activities at laboratories and institutions outside Canada. Apply by letter outlining the proposed program of study or research, accompanied by a letter of support from the student's advisor, a budget and a completed Needs Assessment Form to Student Financial Services by April 1. See ACCESS AWARDS.

OAC '38 Lloyd Minshall Bursaries (OAC)

To recognize the many contributions of Lloyd Minshall to his classmates and to OAC, OAC'38 alumni, with the aid of the Ontario government's OSOTF program, have provided seven bursaries of \$1000 to OAC students with demonstrated financial need. Undergraduate students in semester 5, 6, 7 and 8 and OAC graduate students are eligible. Apply with a completed Needs Assessment Form to Student Financial Services by January 10. See ACCESS AWARDS.

OAC Centennial Graduate Scholarships (OAC)

The Ontario Agricultural College celebrated its 100th anniversary in 1974. Many organizations and companies associated with the agricultural industry provided funds in conjunction with the centennial year activities. Three awards of \$1,500 have been established in perpetuity as a permanent commemoration of the first centennial of the college. Students graduating from a degree program administered by OAC and who plan to pursue graduate studies in any department or school of OAC in the year of baccalaureate graduation are eligible for these awards. The award will be based on achievement in semesters 7 and 8, as well as participation in extracurricular activities throughout the student's university career. Apply to Student Financial Services by April 1.

Ontario Association of Landscape Architects Scholarship (MLA)

The OALA provides an award of \$1,000 for a student who has completed semester three of the master of landscape architecture program. The recipient will be selected on the basis of academic achievement, performance in design studio, and leadership contributions. No application is necessary.

Ontario Egg Producers' Thomas R. Graham Scholarship (Animal and Poultry Science)

The Ontario Egg Producers has provided \$5,000 in scholarship funds in recognition of the contributions of Tom Graham, a 1950 graduate of OAC and a Director. Students registered in the first year of a PhD program and conducting research projects related to the egg industry will be given preference for one \$5,000 scholarship. Alternatively, students registered in the MSc program and conducting research related to the egg industry will be eligible for two awards of \$2,500 each. In addition, the area of research and study must be in the general field of poultry science and may include disciplines other than those offered in the Department of Animal and Poultry Science. Applicants must be Canadian citizens or permanent residents. Selection is based on high academic standing. Apply by July 1, with a letter outlining the area of research and include transcripts of all university work to the Chair, Department of Animal and Poultry Science.

Ontario Food Protection Association Graduate Bursaries in Food Safety (Food Safety and Quality Assurance)

The Ontario Food Protection Association provides two or more bursaries of up to \$1500 each to graduate students enrolled in the Food Safety and Quality Assurance Program who are in financial need. Apply to Student Financial Services with a completed Needs Assessment Form by January 10. See ACCESS AWARDS.

Pioneer Hi-Bred Plant Breeding Scholarship (Plant Agriculture)

Pioneer Hi-Bred International Inc. provides an annual \$18,000 scholarship for an outstanding student in crop breeding who is conducting research in a crop of interest to the company. Potential applicants may contact their program counsellor for updated information on suitable subject crops. No application is necessary. Selection by August 1.

Plant Agriculture Research Scholarship (Plant Agriculture)

The Ontario Flue Cured Tobacco Growers' Marketing Board and the OAC Alumni Foundation, with the aid of the Ontario government's OSOTF program, provide a scholarship of \$3000 to commemorate the formation of the Department of Plant Agriculture at the University of Guelph in 1998. Graduate students in the department who are undertaking research in plant biotechnology, crop adaptation, new crop development, or interdisciplinary research in plant science should apply by letter with a completed Needs Assessment Form to Student Financial Services by January 10. Selection will be based on financial need and academic performance to date. See ACCESS AWARDS.

Ploughshare Scholarship (Rural Studies)

This award is provided by Mrs. Hazel Graham, in memory of husband Willard White Graham. Willard Graham was born into and worked on the family farm all his life caring for the earth and nature using traditional farming methods. The scholarship will provide \$5,000 to an entering Ph.D. student registered in the Rural Studies Program. Selection will be based on academic performance as evidenced by publications, letters of reference and research performance to date. No application is necessary.

Kenneth McAlpine Pretty Scholarship (Land Resource Science)

In memory of Kenneth M. Pretty (OAC '51) a scholarship of \$2,000 is awarded annually to a student in the Department of Land Resource Science who is conducting research in the area of plant nutrition or soil fertility. The recipient will be selected on the basis of high academic achievement. The funds are provided jointly by the late K.M. Pretty and by his former employer, The Phosphate Institute of Canada. Application is not required.

Fred W. Present Scholarship (Plant Agriculture, Environmental Biology)

A scholarship of \$1,000 is provided by the late Fred Present, a graduate of OAC in 1921 and in 1923, and a leader in the field of human and animal nutrition. Graduate students in Plant Agriculture or Environmental Biology who are conducting research on pesticides and their use in the production of food crops are eligible. Academic standing in the previous two years of study will be used to select a recipient from the eligible candidates. Apply by letter to the dean of OAC, by June 1.

Pride Seeds Scholarship (Plant Agriculture)

In recognition of the contribution of Pride Seeds to the corn industry in Ontario, Pride Seeds provides an annual award of \$1,500 to a student conducting research in corn production or corn breeding. The award is given to any Canadian or permanent resident graduate student who has demonstrated competence in corn research in the Department of Plant Agriculture. Apply to the chair, Department of Plant Agriculture, by June 1.

Quinn Memorial Scholarship (OAC)

The Quinn Memorial Fund was established by Helen Farquhar Quinn (OAC'35) in memory of Ronald J. Quinn, OAC '35. A scholarship of \$1,500 is awarded annually to an entering OAC international full time or exchange undergraduate student. Selection will be based on academic performance, letters of reference and an assessment of the application package. Preference will be given to: i) students from developing nations entering a full time undergraduate program in OAC, ii) international exchange students entering an undergraduate program in OAC iii) international students entering an undergraduate program in OAC, iv) students from developing nations entering a graduate program in OAC, v) international students entering an OAC graduate program. No application is necessary.

Reid's Heritage Homes Bursaries in Landscape Architecture (Landscape Architecture)

To allow students with financial need to continue their studies as full-time students, Reid's Heritage Homes Ltd., with the aid of the Ontario government's OSOTF program, has established two bursaries of \$1500 each for students in the BLA or MLA programs. Students must apply by letter with a completed Needs Assessment Form to Student Financial Services by January 10. The awards will be distributed in the winter semester. See ACCESS AWARDS.

N.R. Richards Scholarship (OAC, LRS, RP&D)

The OAC Alumni Foundation has established this scholarship in recognition of Professor N.R. Richards' contribution to the OAC as Dean from 1962 to 1972. Graduating students in OAC who are planning to pursue graduate studies in land resource use and/or rural planning and development at the University of Guelph are eligible. Academic standing will be used to determine the recipient from among the eligible applicants. . Apply by letter to the OAC Awards Office by September 1.

Arthur Richmond Memorial Scholarships (CBS/OAC)

In memory of the late Arthur Richmond (OAC '23), horticulturist and teacher, four scholarships of \$3,500 each are awarded annually to outstanding graduate students in the areas of botany, environmental biology, plant agriculture, microbiology or zoology. Apply to Student Financial Services by May 1.

Robb Graduate Research Travel Grant (OAC)

Travel grants are provided from the estate of the late Martha Robb to graduate students in OAC who are in good academic standing and who are planning to study and/or conduct research at another university or attend a scientific meeting. Apply by letter to the OAC Dean's Office by April 15, including an approved plan of study/research, financial expenditures, and, if appropriate, details of the scientific meeting.

The Robinson Research Travel Grants (CBS Microbiology, OAC Environmental Biology)

These two annual graduate awards of \$400 each are tenable with other Senate awards. Graduate students in the Department of Microbiology in CBS are eligible for one award and graduate students in the Department of Environmental Biology in OAC are eligible for the other. Academic standing will be used to determine the recipient. The funds are to be used to defray costs to attend scientific meetings. Preference will be given to students presenting a paper at a meeting. Application is to the chair of the Department of Environmental Biology, OAC, or the chair of the Department of Microbiology, CBS, as appropriate, by January 31, for travel in the period March 1 each year to February 28 of the succeeding year. The selection committee will be the appropriate college awards committee on recommendation of the chair of the department. The time of the presentation will be arranged by the college awards committee. Donor - Family, friends and associates of the late Dr. John Robinson.

Rural Planning and Development Alumni Scholarship (Rural Planning)

Alumni and faculty of the School of Rural Planning and Development have established a \$1,500 scholarship annually. To be eligible, students must have a minimum 76% cumulative average, be enrolled in the MSc program and have completed two full semesters of full-time study or equivalent. The recipient will be selected on the basis of contributions to the community, both on and off campus. Students or faculty may nominate eligible students to the Director, School of Rural Planning and Development, by June 1.

Rural Planning Field Research Travel Grants (Rural Planning)

The School of Rural Planning provides field research scholarships valued at up to \$6,000 each to graduate students in the School. Apply by letter to the Awards Committee of the School and include an outline of the research proposal on or before March 15. Academic standing and an assessment of the research proposal will be used to determine the recipients.

Schneller and Summers Award (OAC)

The Summers family provides a graduate travel award of \$2,000 in memory of John Summers and Wilfred Schneller. Graduate students in OAC who plan to conduct research or study in other countries with the expectation of bringing direct improvements to Canadian agriculture are eligible. Apply by letter outlining study travel plans and their potential value to Canadian agriculture to the dean, OAC, on or before June 1.

Murray Selves Memorial Scholarship (Executive MBA)

The family and friends of the late Murray Selves, a graduate of OAC in 1957 and a recognized leader and creative entrepreneur in pork production in Ontario, provide a scholarship of \$2,000 annually to a student who is completing phase I of the Executive MBA Program. Applicants must be involved in primary food production as their career employment activity. Preference may be given to Ontario residents. Academic standing and evidence of entrepreneurial and creative approaches in business management will be used to determine the recipient during phase I. Apply by letter to the Director of the EMBA Program by February 1.

Dr. Mohamed Sharom Award of Excellence (Environmental Biology)

This is an annual award of \$900 to an MSc student who has completed at least two full-time semesters, is registered in the Department of Environmental Biology, and holds a valid student visa. The award will be based on academic standing, communication skills and excellence in research. Application is not necessary.

Maurice and Catherine Smith Award (Apiculture, Entomology)

The Family of Maurice and Catherine Smith have established this \$1,000 annual award in order to honour and recognize Maurice's contributions as a long standing faculty member and Catherine's hospitality to students over the years. The award is available to graduate students with a research or study interest in apiculture or entomology. Apply to the OAC Dean's office by June 1. This award is scheduled to end in 2007.

S.J. Smith Memorial Scholarship (Plant Agriculture, Land Resource Science)

An annual \$3,500 award in memory of Silas J. Smith of Chatham, Ontario, is provided to students registered in Plant Agriculture or Land Resource Science who are conducting research in soil fertility, plant nutrition, plant productivity and/or increasing crop yield. Selection will be based on high academic achievement and quality of research performance. Apply by letter outlining your research activities and include a list of publications, to the OAC Awards Office by June 1.

Soden Memorial Scholarships in Agriculture (OAC)

Approximately twenty scholarships of \$3,000 each are awarded to master's students in OAC departments or schools. Students with at least a first-class ('A-') average in previous university work are eligible for consideration. Preference may be given to students who are entering a master's program. Nominations are made three times yearly by each department or school to the OAC awards committee, by May 1, September 1 and January 1. Previous Soden scholars will be considered in a subsequent year in open competition. No application is necessary.

Soybean Research Scholarship (Plant Agriculture)

The award is made available to support graduate students working with soybeans, field beans or other oil seed crops. Recipients are encouraged to use a portion of the award for travel to research stations and/or scientific meetings. The award is valued at \$600, and may be held on more than one occasion. No application is necessary; the chair, Department of Plant Agriculture, will recommend the recipient to the OAC awards committee each year on or before June 1.

Gerald R. Stephenson Scholarship (Environmental Biology and Plant Agriculture)

In 2002, to commemorate their 50th year, CropLife Canada provided a first place prize competition which was won by a team of graduate students from Guelph. The team established a \$1,000 graduate award in the name of their faculty mentor, Dr. Gerry Stephenson, to outstanding students in Environmental Biology or Plant Agriculture who are conducting research in crop protection and are either involved in various extracurricular activities or are teaching assistants. Selection will be based on academic achievement and involvement in extracurricular activities or teaching assistance. Application forms are available in Plant Agriculture and Environmental Biology for submission to the OAC Awards Committee by April 1.

William A. Stewart Bursaries in Dairy Research (Animal and Poultry Science, Food Science, Agricultural Economics and Business)

In recognition of the contributions made by William A. Stewart to the Ontario dairy industry during his tenure as Minister of Agriculture, the Dairy Farmers of Ontario, with the aid of the Ontario government's OSOTF program and the OAC Alumni Foundation, have provided four bursaries of \$2500 each. The bursaries are awarded to full-time MSc students with demonstrated financial need who are enrolled in the Departments of Animal & Poultry Science, Food Science, or Agricultural Economics and Business and who are conducting research related to the dairy industry. A student may receive two bursaries annually. Apply by letter with a completed Needs Assessment Form to Student Financial Services by January 10. See ACCESS AWARDS.

J.L. Tennant Bursary (Agricultural Economics and Business)

Two or more bursaries of up to \$2,000 annually are available to graduate students in financial need in the Department of Agricultural Economics and Business. Application forms are available from the graduate studies committee in Agricultural Economics and Business, and should be completed by September 15.

J.L. Tennant Scholarships (Agricultural Economics and Business)

Three or more scholarships of up to \$1,000 are available to support graduate student research in the area of policy analysis. Students must be enrolled in a graduate research degree program in the Department of Agricultural Economics and Business. Interested students must submit a one-page research proposal to the graduate studies committee in Agricultural Economics and Business by July 15.

Mark Terhune Memorial Research Scholarship (Rural Studies)

This award is provided by Mr. and Mrs. Harry Terhune, along with family and friends, in memory of their son, Mark Terhune BSc (Agr), BEd, MA. Mark was raised on the family farm and had a keen interest in the outdoors and rural issues. The scholarship will provide \$1000 to an entering PhD student registered in the Rural Studies Program. Selection will be based on academic performance as evidenced by publications, letters of reference and research performance to date. No application is necessary, all candidates will automatically be considered by the Rural Studies Admission Committee.

Earl A. Thomas Graduate Scholarship (Food Science)

The late Beryl Thomas of Oakville, Ontario, has provided a scholarship of \$3,200 in memory of her husband, Earl Thomas, who died in 1966 after a 43 year career at Bright's Wines. Mr. Thomas retired from T.G. Bright Co. Ltd. in 1959 as president and general manager. Students enrolled in the Department of Food Science and who are conducting research in oenology are eligible for this graduate scholarship. The recipient will be selected on the basis of high academic achievement. Application is not required.

George Thurtell Graduate Scholarship (Land Resource Science)

Dr. George Thurtell (OAC '57), University Professor Emeritus, has provided a \$4,500 scholarship for a MSc or PhD student registered in the field of atmospheric science in the Department of Land Resource Science and who is pursuing research in atmospheric diffusion, atmospheric turbulence, trace gas fluxes, surface energy balance or meteorological instrumentation. Selection will be based on academic standing and research potential. The award may be received more than once. Students apply by providing a transcript and two letters of recommendation indicating creativity and research potential to the chair of Land Resource Science by September 1.

William Tolton Access Bursaries (Agricultural Economics and Business, Landscape Architecture)

William Tolton, a graduate of OAC in 1936, together with the Ontario government's OSOTF program, provides bursaries of up to \$1500 each to OAC graduate students registered in the MLA and MBA programs in Landscape Architecture and Agricultural Economics and Business respectively. Apply to Student Financial Services by January 10 and include a completed Needs Assessment Form. See ACCESS AWARDS.

Toronto Milk Producer's Scholarship (Animal Science, Food Science, Animal Nutrition)

This scholarship, the gift of the Toronto Milk Producers Association, is based upon the income from securities of \$20,000. Students registered in the first semester of a MSc program in the Departments of Animal and Poultry Science or Food Science will be eligible for the award. The research must be in the general field of animal science with particular reference to subjects related to dairy cattle and dairy products. The scholarship is valued at \$4,000. The selection of the winner will be made by the OAC awards committee and the dean of Graduate Studies. Completed applications, accompanied by a transcript of record, should be made to the OAC dean by June 1.

Toronto Milk Producer's Scholarships (Agricultural Economics and Business)

These scholarships, the gift of the Toronto Milk Producers Association, are based upon the income from securities of approximately \$32,000. Tuition fees, to be distributed among as many graduate students as is possible, will be paid for graduate students enrolled in the Department of Agricultural Economics and Business, whose research is related to the production, marketing or distribution aspects of the dairy industry. The scholarship is for one semester, subject to renewal. The selection of the winner(s) will be made by the OAC awards committee on recommendation of the chair of the department. Application is not required.

Gordon F. Townsend Scholarship (Apiculture)

In memory of professor Gordon F. Townsend, professor emeritus, Department of Environmental Biology and graduate of OAC in 1938, Mr. Donald McKinnon and Mrs. Stephanie Townsend McKinnon have established an award of \$2,200 annually for an outstanding MSc or PhD student in apiculture. Preference will be given to students with an interest in international development. Application is not necessary.

Waldron Rural Studies Ph.D. Entrance Scholarship (Rural Studies)

Donated by Wilda and Mark Waldron, in honour of Mark's contributions as professor and former Director of Graduate Studies of the Rural Extension department, this award of \$1000 is made to a student entering the Rural Studies Ph.D. program who is a Canadian citizen (or permanent resident) and who has demonstrated academic merit and experience in community development. The recipient will be chosen on the basis of previous scholarship as demonstrated by the quantity and quality of their publications. No application necessary. All students entering the program will be considered.

Earnest Austin Weir Memorial Scholarship (OAC)

In memory of the late Earnest Austin Weir, OAC '12, a scholarship of \$2,200 is available each year for entering graduate students in the areas of Land Resource Science, Rural Extension Studies, and Agricultural Economics and Business, Landscape Architecture and Rural Planning and Development who have at least a 'B+' average and will be conducting research on sustainable rural community development. Application is not necessary.

The Mary Edmunds Williams Scholarships (OAC)

Up to seven scholarships, valued at \$10,000 each for two years, will be awarded to entering PhD students. The awards will be paid over two years with the second year of the scholarship requiring academic performance consistent with the requirements for the award and/or the continuing recommendation of the department. Additional scholarships of \$5,000 for one year are awarded to PhD students in OAC departments or schools. Students with at least a first-class ('A-') average in previous academic years are eligible for consideration. Nominations will be made annually by each department or school to the OAC Awards Committee. Williams awards may be held for a maximum of three years. Preference will be given to students from the counties of Caernarvonshire and Anglesey in Wales. No application is necessary.

Reverend Charles Wood Scholarship

The late Reverend Charles Rowell Wood, OAC '38, with the aid of the Ontario Government's has established twelve scholarships of \$2,500 each to graduate students in Rural Extension, Rural Community Design, Rural Community Development or Rural Planning. Academic performance in the previous year of study and financial need based on the distribution of funding will be used to determine the recipients. Apply to Student Financial Services with a completed Needs Assessment Form by January 10. See ACCESS AWARDS.

Ontario Veterinary College Internal Awards

Students registered in the Faculty of Graduate Studies and enrolled in the Ontario Veterinary College should check with the OVC awards committee late in the fall semester regarding application forms and deadlines for the following annual awards. Unless otherwise indicated, apply to the OVC awards committee.

Tippy Atkins Scholarship (OVC)

A scholarship of approximately \$600 is presented to a graduate student pursuing research in canine studies and who is enrolled in the Ontario Veterinary College.

Kon-Tiki Atkins Scholarship

This award of \$500 was established in 1996 by Mr. and Mrs. Maurice Atkins, in memory of their dog, Kon-Tiki, their faithful companion for many years. Students registered in the Faculty of Graduate Studies pursuing research in the canine area in a department of the Ontario Veterinary college are eligible to apply for this award. Application should be made to the OVC Awards Committee before January 31. Selection will be made by the OVC Awards Committee based on recommendation of the principle advisor.

Ayerst, McKenna and Harrison Scholarship (OVC)

Ayerst, McKenna and Harrison Ltd. has established a scholarship of \$750 for a graduate student pursuing a program in an area pertinent to the practice of veterinary medicine in Canada and who is enrolled in a department of the Ontario Veterinary College.

Biomedical Sciences Graduate Scholarship (Biomedical Sciences)

Gifts from faculty and graduate students provide a scholarship for an outstanding student recommended by the Department of Biomedical Sciences. Applicants must have completed two semesters in residence, of which one has been spent participating in research. They must have completed two graduate courses and shown skill in the communication of science.

Kenneth & June Bone Memorial Graduate Scholarship (Pathobiology)

Dr. Kenneth Bone (OVC '38) and Mrs. June Bone of Illinois have provided this annual \$7000 scholarship through their estates, in recognition of Dr. Bone's lifelong commitment to veterinary medicine. The award is presented to the student with the best academic and research performance to date who is registered in the Faculty of Graduate Studies, enrolled in a department of the Ontario Veterinary College and pursuing studies related to companion animal health and disease. Apply to the OVC Awards Committee with research project description, two reference letters, one of which is from the advisor, transcript and publication record by January 15.

Dr. Gerbrand Wietse Bredero Memorial Scholarship (OVC)

This scholarship of approximately \$500 was established in fond memory of Dr. Gerbrand Wietse Bredero, OVC '83, by his family, friends and colleagues. It is presented to a graduate student who has demonstrated achievement in research or clinical investigation by writing a paper of scientific merit that has been accepted for publication in a refereed journal. Preference will be given to students whose research has used alternatives to animal experimentation.

Dr. Casey Buizert Memorial Award (OVC)

Family, friends and classmates (OVC '81) have endowed an award which yields approximately \$500 for graduate students pursuing research in large animals and who are enrolled in a department of the Ontario Veterinary College. The recipient will be selected on the basis of academic performance and demonstrated financial need. Preference will be given to a student enrolled in a postgraduate diploma program.

Caledon Kennel Association Graduate Scholarship (OVC)

The Caledon Kennel Association has donated an \$800 scholarship for a student registered in the faculty of Graduate Studies, enrolled in a department of the Ontario Veterinary College and pursuing studies on companion animals. Preference will be given to students in the field of ophthalmology, but if no suitable ophthalmology candidate is identified, preference will then be given to other companion animal graduate students studying in the areas of cardiology, theriogenology, or endocrinology. Selection will be based on academic performance (research project description, supporting letter from advisor and academic record to date). No application necessary.

Col. K.L. Campbell Graduate Research Travel Grant in Equine Studies (OVC)

A bequest from the late Col. K.L. Campbell, esteemed gentleman and admirer of animals, together with memorial donations from family, friends and colleagues, has endowed an award of approximately \$1,000 for students registered in the Faculty of Graduate Studies and enrolled in a department in the Ontario Veterinary College. The award is intended to support a travel visit related to the student's research project. The recipient will be selected on the basis of academic performance.

Canadian Parrot Symposium Prize in Avian Studies

The Canadian Parrot Symposium has endowed an annual \$250 prize for, in the first instance, a veterinarian registered in the Faculty of Graduate Studies and enrolled in a department in the Ontario Veterinary College. When there is no suitable candidate at the graduate level, the award will be offered, in the second instance, to a graduating DVM student. If there is no suitable graduating candidate, the award will be offered in the third instance, in the fall semester of that year as an undergraduate in-course award. In all cases, the recipient will have been pursuing studies dealing with companion birds and have an interest in avian welfare and the human/companion bird relationship. Selection will be on the basis of academic achievement and dedication to the discipline.

The Allan and Jean Cawley Bursaries

To assist DVM students and graduate students in the Ontario Veterinary College with demonstrated financial need, Allan and Jean Cawley, with the aid of the Ontario government's OSOTF program, provide three \$500 bursaries to students. Apply to Student Financial Services with a completed Needs Assessment Form by January 10. See ACCESS AWARDS.

Ethyl Rose Charney Scholarship in the Human/Animal Bond

This \$13,000 award was established by the estate of Ethyl Rose Charney Makuch through the OVC Pet Trust Fund. Students registered in the Faculty of Graduate Studies and enrolled in a department in the Ontario Veterinary College, pursuing research in the human/animal bond, or other research in companion animal welfare, and/or diseases affecting companion animals are eligible. In the first instance, the scholarship will be offered as an entrance award. If no suitable entering student is identified, it will be offered to in-course students; the award may be held up to two times by masters students and up to three times by doctoral students. If there is no suitable student recipient, the award may be used to support a postdoctoral fellow in one of the eligible research areas.

Blythe James Chase Scholarship (OVC)

This scholarship of approximately \$10,000 is available for a graduate student enrolled in a department of the Ontario Veterinary College. The student's research must be concerned with the well-being of animals and may include research on animal behaviour, human/animal bonding and the care and management of farm and companion animals.

Lena Cooke Award (OVC)

In memory of Lena Cooke, the Cooke family has established an award of \$400 for students registered in the Faculty of Graduate Studies who are pursuing an MSc in a department of the Ontario Veterinary College. The recipient will be selected on the basis of academic standing at admission and demonstrated financial need. Preference will be given to residents of Ontario.

R. A. Curtis Graduate Bovine Scholarship (OVC)

John B. Walkden and Malcolm T. Bond, with the aid of the Ontario government's OSOTF program, provide this \$7500 scholarship for entering graduate students enrolled in a department of the Ontario Veterinary College and intending to pursue studies in cattle. Selection will be based on academic performance and financial need. Apply by letter, including proposed research project description, supporting letter from advisor, academic record to date, and a completed Financial Need Assessment Form to Student Financial Services by January 10. See ACCESS AWARDS.

Gladys (Billie) Davidson Graduate Entrance Scholarships (OVC)

Gladys M. Davidson, with the aid of the Ontario government's OSOTF program, provides these two \$5,000 scholarships for entering students registered in the Faculty of Graduate Studies in a department of the Ontario Veterinary College and intending to pursue studies in companion animals. Preference will be given to students in the field of ophthalmology but, if no suitable candidate is identified, another qualified candidate intending to pursue studies in another area related to companion animals will be considered. Selection will be based on academic performance (proposed research project description, supporting letter from advisor and academic record to date). Apply by letter to Student Financial Services with a completed Needs Assessment Form by January 10. See ACCESS AWARDS.

Don Davis Memorial Scholarship (Clinical Studies)

A scholarship of \$900 has been established in memory of Dr. Don Davis, OVC '48, for a graduate student engaged in equine research who is enrolled in the Department of Clinical Studies at the Ontario Veterinary College.

Dean's ACCESS Bursaries

To assist undergraduate DVM students and graduate students in the Ontario Veterinary College who need financial support, alumni and friends of OVC have provided funds that, with the aid of the Ontario government's OSOTF program, provide bursaries ranging from \$500 to \$2000 per year to in-course students. Apply to Student Financial Services with a completed Needs Assessment Form by January 10. See ACCESS AWARDS.

Dr. Martin DeForest Memorial Bursary (OVC)

The family and friends of Dr. Martin DeForest, OVC '77, have established this bursary fund in his memory. Dr. DeForest was a leader in the veterinary profession, and was widely recognized for his compassion and commitment to animal health. Graduate and undergraduate students registered in the Ontario Veterinary College with demonstrated financial need and who are eligible to continue their studies are encouraged to apply to Student Financial Services with a completed Financial Need Assessment Form by October 7.

Tamara Denberg Memorial Scholarship (OVC)

This scholarship of approximately \$300 is awarded in memory of Tamara D. Denberg, for a graduate student enrolled in a department of the Ontario Veterinary College. Preference will be given to a student pursuing studies in oncology or clinical haematology.

Sharon Dunsmore Scholarship in Feline Studies (OVC)
Sharon Dunsmore was an active and committed animal lover, who gave of her time and resources to support animal welfare. This \$1500 scholarship is given in her honour. The award is presented annually to a graduate student in the Ontario Veterinary College who is pursuing studies related to feline health and disease. Recipients are selected based on academic and research performance to date. Applicants must submit a research project description, transcript, reference letter from advisor and publication record to the OVC Awards Committee by January 15.
Gallant Custom Laboratories Anniversary Scholarship (OVC)
In honour of their fifth anniversary in business, celebrated in 2000, Gallant Custom Laboratories of Cambridge has established this \$2500 award. The scholarship is awarded to a student registered in the Faculty of Graduate Studies, and enrolled in a department of the Ontario Veterinary College, who is pursuing studies in host-agent interactions, immunology, or natural immune systems. Preference is given to students focusing their research on poultry or swine. The recipient is selected based on academic performance and financial need. Applicants must submit a research project description, transcript, reference letter from advisor, publication record and a completed Needs Assessment Form to Student Financial Services by January 10.
The Lady Glencora Bursaries (OVC)
The Rathlyn Foundation, with the aid of the Ontario government's OSOTF program, has established the Lady Glencora bursaries of up to \$5000 each. These awards are available to undergraduate students in the DVM program, students registered in the Faculty of Graduate Studies and enrolled in a department of the Ontario Veterinary College, and undergraduate students in the honours BSc (Bio-Med) program who have demonstrated financial need. Apply to Student Financial Services with a completed Needs Assessment Form by January 10. See ACCESS AWARDS.
Betty Goldhart Scholarship (OVC)
A scholarship of approximately \$400 has been established from funds provided by the estate of Betty Goldhart for a graduate student enrolled in a department of the Ontario Veterinary College. Preference will be given to a student pursuing studies in health-related genetics.
Betty Goldhart Scholarship (Biomedical Sciences)
An amount of approximately \$400 is provided from the estate of Betty Goldhart for one or more awards for graduate students pursuing studies in health related genetics who are enrolled in the Department of Biomedical Sciences.
Jean S. Goudy Memorial Graduate Scholarship (OVC)
The estate of Jean S. Goudy, with the aid of the Ontario government's OSOTF program, has established these graduate scholarships for students entering a graduate program in OVC in the field of companion animal studies. Selection will be based on academic performance (proposed research project description, supporting letter from advisor, academic record to date) and financial need. Apply by letter to Student Financial Services with a completed Needs Assessment Form by January 10. See ACCESS AWARDS.
Dr. Errol Hancock Scholarship (OVC)
A scholarship of approximately \$700 has been established for a veterinarian who is pursuing research in food animal medicine or veterinary public health and who is registered in the Faculty of Graduate Studies and enrolled in a department of the Ontario Veterinary College. Preference will be given to a veterinarian licensed to practice veterinary medicine in Canada.
Dr. Wilson Henderson Memorial Scholarship (OVC)
The estate of Dr. Wilson Henderson (OVC '47) supported by the Ontario government's OSOTF program has established two \$7500 scholarships. They are awarded annually to graduate students who have demonstrated financial need and who are studying in the Ontario Veterinary College preferably in the field of avian pathology. If there are no suitable recipients in this area, students in any branch of veterinary medicine will be considered. The selection will be based on financial need and research potential. Apply to the Associate Dean of Student Affairs, OVC by January 31, submitting a one-page research description, a letter of reference from the principle advisor and a completed Needs Assessment Form. See ACCESS AWARDS.
Elizabeth Holdsworth Scholarship (OVC)
The estate of Elizabeth Holdsworth has established a scholarship of approximately \$900 for a graduate student in OVC whose research is related to the maintenance of health in small animals.

Dennis Howell Memorial Scholarship (OVC)
In memory of Dr. Dennis Howell, a former associate dean and dean of the Ontario Veterinary College and a faculty member from 1967 to 1985, friends in international business and the veterinary profession, and colleagues in the academic community, have established a scholarship for a veterinarian registered in the Faculty of Graduate Studies and enrolled in a department of the Ontario Veterinary College. This scholarship of approximately \$500 is intended to support study or research at the Faculty of Veterinary Medicine and Animal Science, Universiti Pertanian Malaysia.
D.G. Ingram Graduate Research Travel Grant (OVC)
The D.G. Ingram Graduate Travel Scholarship (approximately \$400) is available to graduate students pursuing research in immunology who are enrolled in a department of the Ontario Veterinary College.
D.G. Ingram Memorial Scholarship (OVC)
A scholarship of approximately \$800 is available for a graduate student pursuing research in immunology and who is enrolled in a department of the Ontario Veterinary College.
Marie Leona (Nancy) Johnston Memorial Bursaries (OVC)
The estate of Marie Leona (Nancy) Johnston provides these two \$1200 bursaries for full-time students with satisfactory academic standing who are registered in the Faculty of Graduate Studies and enrolled in a department of the Ontario Veterinary College. Selection is based on greatest financial need. Apply to Student Financial Services with a completed Needs Assessment Form by October 15.
The Kerstay Scholarship (OVC)
The Rathlyn Foundation provides this annual scholarship of \$8000 to an entering or continuing student with demonstrated financial need who is registered in the Faculty of Graduate Studies in a department of the Ontario Veterinary College and pursues research in companion animals. Preference will be given to students in the field of ophthalmology but, if no suitable ophthalmology candidate is identified, preference will then be given to students in neurology. Selection will be based on academic performance and financial need. The scholarship may be held for up to three years provided that academic performance is satisfactory, as recommended by the Graduate Studies and Research Committee, and financial need is demonstrated. Apply by letter with a completed Needs Assessment Form to Student Financial Services by October 1 in the year when there is a competition.
Korean-Canadian Dr. F. Schofield Memorial Scholarship (Pathobiology)
This \$2000 award was established by the Dr. Schofield Memorial Association of Korean-Canadian, in partnership with the Korean-Canadian Scholarship Association. The scholarship honours Dr. Frank Schofield's active role in the Korean independence movement, as well as his academic and medical contributions in the early 20th century. It is awarded annually to a student registered in the Faculty of Graduate Studies who is enrolled in the department of Pathobiology at the Ontario Veterinary College. The recipient must demonstrate scholarship and must have contributed to the academic life of the department and College, in the tradition of Dr. Schofield. He or she will also be recognized at the Korean-Canadian Scholarship Foundation dinner in Toronto in March. Apply to the OVC Awards Committee with an academic curriculum vitae and transcript by January 15.
Laforet Research Assistantship (OVC)
An assistantship with a maximum value of approximately \$12,800 has been established from the estate of Alma and Raymond Laforet for a student enrolled in a graduate program in a department of the Ontario Veterinary College. The assistantship is awarded on the basis of academic performance, three letters of reference and demonstrated financial need. It is awarded yearly on a competitive basis.
Col. Benjamin F. Leach Scholarship (OVC)
Mrs. Charlotte Leach-Barry of St. Albans, Vermont, has established this scholarship in memory of her brother who graduated from OVC in 1935. This award recognizes the appreciation of Dr. Leach's family for the education he received at the OVC and his lifelong commitment to the safety of the food chain, expressed through his work with U.S. regulatory bodies while serving with the U.S. Army and Airforce. The recipient will be a graduate student conducting research in a public health area, such as the production of safe foods from animals.
Gloria Lemieux Bursaries (OVC)
Established by the late Gloria Lemieux through a will bequest, these bursaries recognize her concern for animals and desire to help students pursuing veterinary studies. The awards are available to full-time undergraduate students in the DVM program and to graduate students enrolled in a department of the Ontario Veterinary College with demonstrated financial need. Apply to Student Financial Services with a completed Financial Need Assessment Form by October 7.

Joy Lindvik Memorial Scholarship (OVC)
A scholarship of approximately \$700 is awarded to a graduate student engaged in equine research who is enrolled in a department of the Ontario Veterinary College. Preference will be given to students carrying out research in the areas of exercise physiology, training, performance assessment, or health management.
Donald R. MacDonald Memorial Book Prize (Population Medicine)
The family of Dr. Donald R. MacDonald, OVC '42, donates a monetary book prize of approximately \$500 for a graduate student conducting research in veterinary public health and who is enrolled in the Department of Population Medicine.
Malcolm Scholarship (OVC)
The estate of Mary Doris Malcolm has established a scholarship of approximately \$800 for a graduate student who is pursuing studies in equine health and disease and who is enrolled in a department of the Ontario Veterinary College.
Margaret A.B. Maxwell Memorial Scholarship (OVC)
The estate of Dr. Margaret A.B. Maxwell has established a scholarship of approximately \$9,000 to honour her commitment to the protection of wildlife. The recipient will be a veterinarian pursuing research related to the diseases of wildlife or the care, well-being and preservation of wild species, and who is registered in the Faculty of Graduate Studies and enrolled in a department of the Ontario Veterinary College. In the case of equally qualified applicants, the award will be divided.
Dr. R.A. McIntosh Graduate Award (OVC)
The class of OVC '45, on the occasion of the 50th reunion, established this award in honour of their former teacher, whose career at OVC spanned the period 1919 - 1951. Dr. McIntosh taught diseases of cattle, obstetrics, pharmacy, therapeutics, and diseases of ruminants and swine. He was an outstanding teacher and an inspiration to all. It is available to OVC graduate students working in large-animal research. Preference will be given to research on cattle diseases.
Dr. McSherry and Dr. Valli Scholarship for General Proficiency in Clinical Pathology (OVC)
This \$600 scholarship has been established by Dr. Victor E. (Ted) Valli, DVM '62, MSc '66, PhD '70, in honour of his mentor and retired professor of the Department of Pathology (now the Dept. of Pathobiology, OVC.), Dr. Bernard McSherry, DVM '42, MSc '57. The scholarship will be awarded to a graduate student who is enrolled in the Department of Pathobiology at the Ontario Veterinary College. Selection will be based on academic achievement, demonstrated creativity and diagnostic expertise, with an emphasis placed on work done in the area of clinical pathology. Apply to the OVC Awards Committee including a letter of recommendation of up to two pages from academic advisor by January 10.
Merial Graduate Scholarship (OVC)
A scholarship of \$500 is given to a graduate student enrolled in a department of the Ontario Veterinary College. Preference will be given to a student pursuing studies in parasitology.
Margaret Emma (Peggy) and Donald Alan Melton Bursaries (OVC)
Donald Alan Melton, with the aid of the Ontario government's OSOTF program, as a memorial to his beloved wife, Peggy, and in recognition of her lifelong devotion to animals and concern for their welfare, provides these \$1000 bursaries. The awards are available to full-time undergraduate students in the DVM program and to graduate students registered in the Faculty of Graduate Studies and enrolled in a department of the Ontario Veterinary College. Eligible undergraduate students must have completed two semesters of their program with satisfactory academic performance. Apply to Student Financial Services with a completed Needs Assessment Form by January 10. See ACCESS AWARDS.
Milton Travel Scholarship (OVC)
Ayerst Laboratories has established the Milton Travel Scholarship in honour of Fred Milton, a long-time employee and a friend to veterinarians. This scholarship of approximately \$200 is a travel award for academic purposes for a veterinarian registered in the Faculty of Graduate Studies and enrolled in a department of the Ontario Veterinary College.
Natasha Scholarship (Clinical Studies)
The Natasha Fund provides this annual scholarship of \$25,000 to an entering student who is registered in the Faculty of Graduate Studies and enrolled in the department of Clinical Studies and intending to pursue studies in companion animals. Preference will be given to students in the field of critical care but, if no suitable candidate is identified, the award may be given to another qualified student in small animal medicine. Selection will be based on academic performance. The scholarship may be held for up to three years provided that academic performance is satisfactory. No application is necessary.

Dr. Francis H.S. Newbould Scholarship (OVC)
To honour the memory of Prof. Frank Newbould, a much respected faculty member in the Ontario Veterinary College (1956-1977), his family, with the aid of the Ontario government's OSOTF program, has created this \$1000 award which is presented to a graduate student in the Ontario Veterinary College who is working in the field of mastitis research, in the first instance or, in the second instance, in the broader area of microbiology. Apply by letter to the OVC Assistant Dean for Student Affairs including a description of the research project, a letter from the principal advisor stating academic and research performance to date, a transcript and a completed Needs Assessment Form by January 31. See ACCESS AWARDS.
Novartis Graduate Scholarship in Parasitology (OVC)
Novartis Animal Health Canada Inc., with the aid of the Ontario government's OSOTF program provides this \$1500 scholarship to a graduate student in the Ontario Veterinary College studying in the field of parasitology. Apply by letter to the OVC Assistant Dean for Student Affairs and include a description of the research project, a letter from the principal advisor that states academic and research performance to date, a transcript and a completed Needs Assessment Form by January 31. See ACCESS AWARDS.
Novartis Graduate Scholarship in Cardiology (OVC)
Novartis Animal Health Canada Inc., with the aid of the Ontario government's OSOTF program, provides this \$1500 scholarship to a graduate student in the Ontario Veterinary College studying in the field of cardiology. Apply by letter to the OVC Assistant Dean for Student Affairs and include a description of the research project, a letter from the principal advisor that states academic and research performance to date, a transcript and a completed Needs Assessment Form by January 31. See ACCESS AWARDS.
OVC'49 and Dr. Ray Cormack Graduate Entrance Scholarship (OVC)
To commemorate the 50th anniversary of their graduation from the College, the Class of OVC'49 and Dr. Ray Cormack (OVC'49) have established this graduate entrance scholarship of \$3500 for veterinarians entering a graduate program in OVC. Apply by letter to Student Financial Services including a description of the research project, a letter from the principal advisor, a transcript and a completed Needs Assessment Form by October 1.
OVC'57 Graduate Scholarship (OVC)
In honour of the 40th anniversary of their graduation from the College, the class of OVC'57, with the aid of the Ontario government's OSOTF program, provides this annual \$1250 scholarship to a veterinarian who is an entering or continuing student with demonstrated financial need. The recipient must be registered, or intending to register, in the Faculty of Graduate Studies, and enrolled, or intending to enrol, in a department of the Ontario Veterinary College. Selection will be based on academic performance and financial need. Apply by letter with a completed Needs Assessment Form to Student Financial Services by January 10. See ACCESS AWARD section above.
OVC Graduate Student Recognition Awards (OVC)
A framed certificate and/or a monetary award will be presented by the OVC Graduate Student Association and the Ontario Veterinary College Awards Committee to a graduate student in each department who has made a significant contribution to graduate student and community life. The recipient will be selected by a department-wide vote of registered graduate students. No application required.
Ontario Veterinary College Alumni Association Scholarship (Clinical Studies, OVC)
The Ontario Veterinary College Alumni Association provides two scholarships of \$2,000 each to graduate students enrolled in departments of the Ontario Veterinary College. One scholarship will be given to a student in the Department of Clinical Studies, and the second to a student in one of the other departments.
Pathobiology Award for Graduate Student Excellence
Faculty, staff and colleagues in the Department of Pathobiology donate an award of approximately \$500 for students registered in the Faculty of Graduate Studies and enrolled in the department. Eligible students may be nominated by any department faculty member or graduate student and will be selected on the basis of academic performance and contributions to the intellectual life of the department. One or more awards may be available annually. No application required.
Harry and Lorna Robbins Memorial Scholarship (Clinical Studies)
Income of approximately \$4,000 will be used to provide an award for one or more students registered in the Faculty of Graduate Studies and pursuing research in small-animal medicine or surgery in the Department of Clinical Studies, Ontario Veterinary College.

Peter and Christina Robertson Memorial Award (OVC)

The family of Peter and Christina Robertson, whose lives were dedicated to the preservation of wild animals and their environment, have established an annual memorial award. Students registered in the Faculty of Graduate Studies and enrolled in a department of the Ontario Veterinary College who are pursuing research related to diseases of wildlife, their health and welfare and/or their environment, are eligible to apply. The recipient(s) will be selected on the basis of academic performance, dedication to the discipline and demonstrated need for financial assistance. The recipient must be licensed to practice veterinary medicine in Canada.

Soren Rosendal Memorial Research Prize (Pathobiology)

To honour the memory of Dr. Soren Rosendal, a highly respected researcher and teacher at the Ontario Veterinary College, a prize of \$500 is awarded to a graduate student in the Department of Pathobiology who has made an outstanding contribution to new knowledge in the course of her/his research. Nominations may be made by any graduate student or faculty member in the department and should be accompanied by a brief statement of one page or less describing the research contribution made by the student. An award need not be made every year.

Roland A. W. Scott Memorial Scholarship (OVC)

The class of OVC '85, OVC graduate students and family and friends of Dr. Roland A. W. Scott, OVC '85, have donated a scholarship of approximately \$350 in his memory. This scholarship is for graduate students enrolled in a department of the Ontario Veterinary College who are engaged in work related to laboratory or zoo animals.

Secord-Currey Scholarship (OVC)

Dr. A. Secord and Dr. R. Currey, OVC '29, small animal practitioners with an interest in animal behaviour and the relationships between humans and companion animals, have endowed a scholarship yielding approximately \$1,000 per year for a student pursuing research on the human/animal bond, or the behaviour of companion animals who is registered in the Faculty of Graduate Studies and enrolled in a department at the Ontario Veterinary College.

Secord-Currey Scholarship in the Companion-Animal Bond (OVC)

Dr. Alan Secord (OVC'29) and Dr. Raymond Currey (OVC'29), small animal practitioners with an interest in animal behaviour and relationships between humans and companion animals, have endowed this annual scholarship of \$29,000 for an entering student registered in the Faculty of Graduate Studies, enrolled in a department of the Ontario Veterinary College and intending to pursue studies related to the human-companion animal bond. Selection will be based on academic performance (proposed research project description, supporting letter from advisor, academic record to date). Financial need will be considered. The scholarship may be held for up to four years provided that academic performance is satisfactory. Preference will be given to doctoral students and to those holding the DVM degree. No application is necessary.

Dr. J. Sherman Memorial Research Travel Grant (Pathobiology)

An award of approximately \$150 is available to support travel for a graduate student enrolled in the Department of Pathobiology.

Small Animal Graduate Research Scholarship (OVC)

A scholarship of approximately \$1,200 is awarded to a graduate student who is engaged in canine or feline research and is enrolled in a department of the Ontario Veterinary College.

Tasha Scholarship (OVC)

The Rathlyn Foundation provides this annual scholarship of \$22,000 to an entering student who is registered in the Faculty of Graduate Studies, enrolled in the DVSc program of a department of the Ontario Veterinary College and pursuing studies in avian, wild birds, or exotic species. Preference will be given to students who are working in the avian, wild birds, or exotic species areas but, if no candidate who meets the eligibility and selection criteria in this area is identified, the award may be given to another DVSc student in the small animal area. If there is no suitable DVSc candidate, the award may be given to a qualified PhD student carrying out biomedical research in the avian, wild birds, or exotic species areas in any other OVC department. Selection will be based on academic performance. The scholarship may be held for up to three years provided that academic performance is satisfactory. Apply by letter, to the Chair, OVC Awards Committee, including three letters of recommendation, a resume and a transcript, by July 31.

Vétoquinol Scholarship in Geriatrics in Companion Animals (OVC)

Vétoquinol N-A Inc. offers this \$1,000 award to a graduate student who is enrolled in a department of the Ontario Veterinary College and pursuing studies related to geriatrics with a minimum 80% average. Apply to the OVC Awards Committee with a one page research project description, reference letter from advisor, transcript and publication record by January 15.

Vétoquinol Scholarship in Swine Health (OVC)

Vétoquinol N-A Inc. offers this \$1,000 award to a graduate student who is enrolled in a department of the Ontario Veterinary College and pursuing studies related to swine health with a minimum 80% average. Preference will be given to students undertaking studies in metabolic diseases of swine, but students conducting research in swine behaviour and/or welfare, infectious disease, and management of systems to improve growth, production and health will also be eligible. Apply to the OVC Awards Committee with a one page research project description, reference letter from advisor, transcript and publication record by January 15.

Dr. Don Willitts Memorial Graduate Scholarship (OVC)

Mrs. Jean Willitts has established this \$1300 scholarship in memory of her husband, Dr. Don Willitts, OVC '54. The scholarship is presented to a graduate student, enrolled in a department of the Ontario Veterinary College, who holds a DVM degree. The recipient will demonstrate continuous personal and professional growth and development that exemplifies dedication to the discipline and a positive attitude toward learning throughout graduate training. The applicant's research project will have practical application to veterinary medicine. Apply by letter to the OVC Awards Committee by January 15, including a transcript, letter from principal advisor and curriculum vitae.

XI. Administration & Faculty

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Members of regular graduate faculty are appointed from among the faculty members of the university, on recommendation of their department chair or director of a school to the Board of Graduate Studies. Membership is contingent upon continuing participation in the graduate program of the university and is subject to annual review. Faculty members in departments without graduate programs may be appointed as graduate faculty in another department. Members of associated graduate faculty are appointed from among other than faculty members of the university on the recommendation of the department chair or director of a school. Membership is contingent upon continuing participation in the graduate program of the university and is subject to review. Associated graduate faculty may participate as co-advisors, serve on advisory committees, participate in graduate examinations and teach graduate courses. Individuals appointed by the university to teach a graduate course on a limited basis, serve on examining committees or are appointed to an advisory committee for a limited time are designated as special graduate faculty. The term of appointment is defined at the time of appointment.

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Graduate Students' Association

All graduate students of the University of Guelph, including part-time students, are members of the association and are encouraged to participate in its events and activities.

The purposes of the association are: to represent the graduate student body in all matters pertinent to its welfare; to act as a liaison between the graduate student body and faculty, the administration and the undergraduate student body; and to promote social and cultural activities.

The Grad Lounge is a licensed lounge facility and common area. It is located on Level 5, of the University Centre, Ext. 58117. These facilities provide a focal point for social and cultural activities of graduate students.

The GSA administers the Dental Plan and sets guidelines and policies on the Health Plan for all full-time graduate students.

The office for the Graduate Students' Association is beside the Graduate Student Lounge, University Centre, Level 5 (Room 524 U.C. North) Ext. 56685.

Elections are held in February for the following executive positions (term effective May 1 to April 30 of each year):

- President
- Vice-President Internal
- Vice-President External
- Vice-President Finance
- Vice-President Activities and Media

The governing body of the Association is the Board of Directors, consisting of the executive officers and departmental representatives. For a current listing of monthly meeting dates, please call the GSA office at Ext. 56685 or visit the GSA website: www.uoguelph.ca/~gsa. All graduate students are welcome to attend.

Appendix A - Courses

Courses are listed in the appendix in alphabetic order and may also be found listed under the program in which they are offered.

Agricultural Business

AGBU*6070 Research Methods for Managers W [0.50]

The objective of the course is to provide students with a working knowledge of quantitative and qualitative techniques used in the analysis of management problems. The emphasis is on the application and interpretation of quantitative and qualitative methods rather than on theoretical background.

Restriction(s): Distance MBA students only.

AGBU*6100 Food and Agribusiness Economics and Policy U [0.50]

An analysis of economic and policy issues relevant for food and agribusiness managers in affluent economies, with emphasis on the economic and policy environment that exists within North America.

Restriction(s): Distance MBA students only.

AGBU*6120 Marketing Management W [0.50]

A study of marketing decision-making in food and agribusiness firms, with emphasis on the formulation of strategic marketing plans.

Restriction(s): Distance MBA students only.

AGBU*6180 Financial and Managerial Accounting U [0.50]

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

Restriction(s): Distance MBA students only.

AGBU*6200 Financial Management U [0.50]

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

Prerequisite(s): AGBU*6180 Financial and Managerial Accounting

Restriction(s): Distance MBA students only.

AGBU*6300 Problems in Agribusiness - Summer Residency S [0.50]

A seven-day intensive session, delivered at the University of Guelph, that focuses on the development of a management plan for an agribusiness organization through the use of group case studies, seminars and speakers.

AGBU*6400 Food and Agribusiness Strategic Management U [0.50]

An advanced course requiring the application of conceptual, analytical, problem identification, and problem solving skills to develop organizational strategy. Food, agribusiness and other cases are used to explore the development and implementation of strategy and to assess the dynamic relationship between strategy and competition.

Restriction(s): Distance MBA students only.

AGBU*6510 Managing Price Risk W [0.50]

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

Restriction(s): Distance MBA students only

AGBU*6520 Marketing Research and Analysis F [0.50]

Students will learn the fundamentals of marketing research and analysis as they apply to decision-making. The key focus of the course will be on developing a marketing plan for a real product/service. Input into the marketing plan will come from actual marketing research information collected, analyzed and interpreted by participants. Students will develop and implement background-marketing research that can be used at the conclusion of the course to build the marketing plan. In addition to developing general research skills, special topics such as perceptual mapping for positioning, conjoint analysis for pricing and clustering for segmentation will be examined.

AGBU*6530 Management Issues in Agriculture W [0.50]

This course discusses the application of general management concepts and practices to agricultural production. Topics include strategies farm managers can use to assess performance, set direction, build capabilities and implement change. All readings and cases are taken from the viewpoint of an owner-operator of a commercial farming operation.

AGBU*6610 Dairy Production Management W [0.50]

This course deals with the specifics of applying business management strategies to farm operations. Trends facing the North American dairy industries and challenges faced by individual producers are examined. Relevant and practical operating decision-making and management skills are considered with the intent of maximizing the profitability and reducing the risk of the individual firm.

AGBU*6620 Swine Production Management W [0.25]

This course deals with the specifics of applying business management strategies to farm operations. Trends facing the North American swine industries and challenges faced by individual producers are examined. Relevant and practical operating decision-making and management skills are considered with the intent of maximizing the profitability and reducing the risk of the individual firm.

AGBU*6700 Special Topics in Agribusiness Management U [0.50]

A special topic course focusing on relevant business issues or problems allowing students to enhance and further develop expertise in specific areas of management. May be offered to students in any semester.

AGBU*6800 Directed Research Project U [0.50]

A management research project leading to a referenced report focusing on selected topics of interest in agricultural business.

Agricultural Economics

AGEC*6020 Economics of Food Safety and Quality U [0.50]

The overall aim of the course is to explore economic aspects of food safety and quality and the ways in which economics can aid understanding of food safety and quality issues.

Prerequisite(s): ECON*3710 or ECON*6000.

AGEC*6070 Research Methods for Managers F [0.50]

The objective of the course is to provide students with a working knowledge of quantitative and qualitative techniques used in the analysis of management problems. The emphasis is on the application and interpretation of quantitative and qualitative methods rather than on theoretical background.

AGEC*6100 The Methodology 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.

AGEC*6110 Marketing Research W [0.50]

A study of marketing research analysis in agribusiness firms, with emphasis on the marketing research function and the application of quantitative problem solving techniques.

AGEC*6120 Marketing Management F [0.50]

A study of marketing decision-making in agribusiness firms, with emphasis on the formulation of strategic marketing plans

AGEC*6130 Special Topics in Financial Management U [0.50]

An advanced course for students who wish to explore current and future topics in financial management, trends and problems in financial management, and capital and investment theory related to food and agribusiness firms.

AGEC*6140 Food and Agribusiness Strategic Management U [0.50]

An advanced course requiring the application of conceptual, analytical, problem identification, and problem solving skills to develop organizational strategy. Food, agribusiness and other cases are used to explore the development and implementation of strategy and to assess the dynamic relationship between strategy and competition.

AGEC*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.

AGEC*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): AGECE*6180

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

AGEC*6220 Agricultural Policy W [0.50]

A critical analysis of contemporary issues in the agricultural policy of affluent economies, with emphasis on Canadian policies.

AGEC*6230 Food and Agribusiness Economics and Policy W [0.50]
An analysis of economic and policy issues relevant for food and agribusiness managers in affluent economies, with emphasis on the economic and policy environment that exists within North America.
AGEC*6240 Agricultural Trade F [0.50]
An examination of conceptual and empirical problems, policies, and institutional arrangements in international trade of agricultural products.
AGEC*6250 Futures and Options W [0.50]
The theory and application of futures, options and other derivative securities for marketing, risk management, and investment purposes. Emphasis is placed on application of the instruments to real business situations, and on the development and implementation of trading strategies designed to meet the precise needs of specific business clients.
AGEC*6260 Managing Business Risk U [0.50]
This course is designed to help students recognize, measure and understand different components of business risk. Case studies are used to explore and evaluate risk management alternatives and to implement and monitor risk mitigating strategies. Corporate responsibility in relation to risk management is also addressed.
AGEC*6320 Cost Benefit Analysis S [0.50]
A presentation of the theory and methods used in cost benefit analysis. The course will examine selected case studies; and it will include a discussion of both renewable and non-renewable resources.
AGEC*6360 Mathematical Programming F [0.50]
A study of the algebra, assumptions and economic logic of important optimizing techniques and their application to problems in quantitative economics.
AGEC*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.
AGEC*6410 Operations Management I S [0.50]
Overview of the management problems involved in planning, operating and controlling the systems used in operations, with emphasis on farm and agribusiness applications.
AGEC*6420 The Economic of the Firm: Concepts and Applications F [0.50]
This course examines the traditional production economics literature on production functions, cost functions and profit functions as those relationships are used in applied economics analysis. The theory behind the certainty equivalent profit model and its application to decision making under risk is introduced. Optimal capital replacement models used agricultural economics are studied. Finally, selected new developments in the economic theory of the firm are examined.
AGEC*6430 Case Studies in Farm Management U [0.50]
Identification of problems and opportunities on selected representative farms; use of selected management tools for diagnostic analysis and planning; evaluation of relevant management strategies based on the concept of management as a continuous decision-making process.
AGEC*6540 Advanced Price Analysis W [0.50]
The application of microeconomic theory to agricultural commodity modelling, with emphasis on the specification, estimation and interpretation of supply, demand and market equilibrium models.
AGEC*6570 Advanced Agricultural Marketing Analysis S [0.50]
A study of agricultural and food marketing problems with particular emphasis on the application of economic theory and research methods to selected empirical problems. <i>Prerequisite(s):</i> ECON*3710 or ECON*6000
AGEC*6600 Agriculture in Economic Development F [0.50]
The course is concerned with the role of agriculture as a source of food, fibre and employment in developing countries. The interaction between agriculture and other sectors of the economy and other countries is also examined. <i>Prerequisite(s):</i> ECON*1050 and ECON*1100
AGEC*6610 Economics of Renewable Resources F [0.50]
This course is concerned with the optimal use of renewable resources, i.e., resources that exhibit growth or regeneration over a cycle. Models of dynamic allocation are discussed and the role of government in altering the market allocation is considered.
AGEC*6630 Regional Economic Models U [0.50]
Theories and research in regional economics stressing regional development, socio-economic accounting, analysis of structure and growth, economic base and multiplier models.

AGEC*6690 Program Evaluation U [0.50]
An advanced seminar dealing with the theory and practice of program evaluation focusing on public sector programs in agriculture and rural development, international and domestic case studies.
AGEC*6700 Advanced Resource Economics W [0.50]
Seminar on the literature, current research, and methods of analysis in natural resource economics.
AGEC*6720 Readings in Agricultural Economics F,S,W [0.00]
A reading course on selected topics of special interest. May be offered to individual students or to groups of students in any semester.
AGEC*6750 Problems in Agricultural Business F [0.50]
Seminar course with industry speakers, in preparation to AGEC*6760, and leading to a formal business project proposal.
AGEC*6760 Major Project in Food and Agribusiness Management U [0.50]
Management project leading to a referenced technical report on some aspect of food and agribusiness management. Completion of this course requires a formal presentation of the project to faculty and students.
AGEC*6800 Seminar in Agricultural Economics F,S [0.50]
Students in the MSc and PhD programs must present a department seminar on a topic of the student's choice in agricultural economics. For MSc students the seminar must be presented by the completion of their fourth semester in the program.

Animal Science

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.
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*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*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 Quantitative Genetics and Animal Breeding F [0.50]
Current literature and classical papers pertaining to quantitative genetics and breeding are reviewed in detail.
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.
ANSC*6260 Digestion and Metabolism in the Ruminant (even years only) W [0.50]
A review of current research on rumen function, post-ruminal digestion and host tissue metabolism, integrating fundamental principles so as to formulate models of nutrient utilization. The course consists of assigned readings, lectures and tutorial
ANSC*6360 Techniques in Animal Nutrition Research (even years only) F [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*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*6380 Estimation of Genetic Parameters W [0.50]
The course covers Bayesian approaches to analysis of data; categorical data analysis; accounting for selection bias; major gene analyses; models for handling marker genes; and recent developments in statistical methodology related to animal breeding applications.

ANSC*6390 QTL's and Markers (offered all years pending demand) W [0.50]
Advanced training in the mathematical aspects of quantitative genetic theory as applied to animal breeding.
ANSC*6400 Mammalian Reproduction (odd years only) F [0.50]
Discussions and applications of methodology for collection and examination of gametes and embryos and for measurements of hormones in biological fluids.
ANSC*6440 Advanced Concepts and Methods in Applied Ethology W [0.50]
An in-depth review of classic papers and current topics in applied ethology. Discussions will include applications of methodologies and analyses used to conduct animal behaviour research.
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.
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*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.

Anthropology

ANTH*6080 Anthropological Theory F [0.50]
An examination of classical and contemporary anthropological theory, including an emphasis on the most recent directions in the discipline.
ANTH*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.
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 Development, Community and Rurality U [0.50]
This course will examine issues in different theories and models to explain rural and community change and persistence within a globalized system. While the emphasis will be on local continuity and change from a sociological and/or anthropological perspective, this will be discussed within a framework of international political economy. Case studies will be selected to illustrate different modes of change and resistance from different contexts. In particular, the role of community-led and participatory forms of development, social organization, social capital, land tenure, gender, agro-food systems, subsistence and commodification, governance, land use and environment management will be amongst topics considered. Students will be encouraged to focus their research on some of these issues in a geographical region of interest to them.
ANTH*6460 Gender and Development F [0.50]
Cross-cultural and historical changes in gender relations and the roles/positions of women brought about by industrialization and the development of the world system. Critical examination of the predominant theories of gender relations, in so far as these inform development research and action in societies with different socio-economic systems. Introduction to the latest theories and research in the area of women and development, as well as with social and political actions undertaken by women themselves. This is one of the two alternative core courses for the Collaborative International Development Studies program.

ANTH*6480 Work 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 global economic change. Using case studies of particular work worlds, the course may include topics such as changing patterns of work in comparative contexts; labour discipline, organizations and protest; industrial and organizational change; education for work; economic restructuring and reconfigurations of gender, race and class within and beyond the shop floor.
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.
ANTH*6700 Pro-seminar F-W [0.00]
The pro-seminar concerns matters involved in graduate studies and later work as a professional sociologist or anthropologist, including how to form a graduate advisory committee, assistantship responsibilities, presentation skills, exploration of careers in sociology and anthropology, writing grant proposals, reports and articles, and teaching. In the first semester students will begin to prepare research proposals for theses and major papers.

Aquaculture

AQUA*6000 Special Project in Aquaculture F,S,W [1.00]
An intensive learning opportunity focusing on an applied problem in the aquaculture industry. Completion of a literature review and project, in concert with hands-on experience with live animals, either in a research or commercial setting, form the basis of a final report and oral presentation to be made to a committee of core program faculty. Practical experience is also gained through on-site training at the Alma Aquaculture Research Station.
AQUA*6100 Science and Technology in Aquaculture F [0.50]
A formal lecture, student seminar and essay course designed to examine the role of science and technology in the aquaculture industry. Latest advances in the scientific community are explored, with special attention to those developments having promise for commercialization and technology transfer to the private sector. The course will explore the relationships between basic and applied science, and the development of new technology for the industry.
AQUA*6200 Practicum in Aquaculture: Culture of Salmonids S [0.50]
Using a problem-solving approach, students will complete a series of models at the Alma Aquaculture Research Station covering topics in water management, hatchery operations, propagation techniques, feeding and nutrition, health and disease, economics and regulatory issues. Students will solve practical problems from both a theoretical and applied perspective.

Biomedical Science

BIOM*6060 Functional Neuroanatomy U [0.50]
A course emphasizing the structure and function of the mammalian nervous system and organs of special sense.
BIOM*6070 Pregnancy, Birth and Perinatal Adaptations U [0.50]
A multidisciplinary seminar course to promote understanding of physiological processes occurring during mammalian pregnancy, from implantation to the perinatal period. Regulation of homeostasis and growth as well as both maternal and fetal factors that contribute to suboptimal gestational outcomes are covered.
BIOM*6110 Advanced Microscopy for Biomedical Sciences U [0.50]
Routine and specialized procedures for light microscopy, and transmission and scanning electron microscopy are examined through lectures, discussions and practical exercises. Interpretation of micrographs is included.
BIOM*6130 Vertebrate Developmental Biology U [0.50]
The principles of vertebrate development are examined through lectures, discussions and practical exercises. Topics include aspects of gametogenesis, fertilization, implantation, embryonic and fetal development and experimental manipulation of embryos. Emphasis is on mammalian development and topics may vary depending on student needs and interests.

BIOM*6160 Cellular Biology U [0.50]

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

BIOM*6190 Tissue Culture Techniques in Biomedical Sciences U [0.50]

An introduction to in vitro techniques examining aspects and principles of the culture environment, isolation methods, propagation, characterization and storage of cultured cells, gametes and embryos. Practical exercises and student assignments complement material presented in lecture and seminar format.

BIOM*6440 Biomedical Toxicology U [0.50]

The course examines chemical compounds injurious to animals and man, toxicity testing, teratogens, carcinogens, factors influencing toxicity, and toxic drug interactions. The mechanism of action, metabolism, and principles of antidotal treatment are also studied.

BIOM*6480 Pharmacodynamics and Pharmacokinetics U [0.50]

This course describes drug absorption, distribution, biotransformation and elimination in animals and human beings, and emphasizes factors which modify drug behaviour. It integrates molecular mechanisms with physiological processes and highlights the importance of receptors and second messengers in cellular responses to pharmacologic agents.

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

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

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

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

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

See BIOM*6601 above.

BIOM*6610 Vascular Biology U [0.50]

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

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

Permits further in depth study of developmental and morphological sciences.

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

See BIOM*6701 above.

BIOM*6711 Special Topics in Physiology & Biochemistry U [0.25]

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

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

See BIOM*6711 above.

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

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

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

See BIOM*6721 above.

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

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

BIOP*6010 Biophysics Seminar U [0.00]

Public seminar presented by all PhD students in the Biophysics program. This seminar is to be presented within four semesters from entry to the program. The course is optional for MSc students.

Prerequisite(s): Prerequisite BIOP*6000.

BIOM*6950 Advanced Topics in Biophysics U [0.50]

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

Botany**BOT*6030 Plant Cell Biology (odd years, first offered in 2003) U [0.50]**

An examination and discussion of structure-function relationships at the subcellular level during plant growth and development. Organelles and their roles in biosynthetic, bioenergetic, and physiological processes that are unique to plants will be examined. Offered in conjunction with PBIO*4030. Extra work is required of graduate students.

BOT*6403 Seed Development and Germination (even years) U [0.50]

Physiological, biochemical and molecular aspects of seed development and germination and establishment of the seedling will be discussed in lectures and discussions of recent advances in the literature.

BOT*6405 Modern Approaches to Plant Ultrastructure U [0.50]

An introduction to some of the recent advances in electron microscopy and laser scanning confocal microscopy and their application to ultrastructural studies of plant systems.

BOT*6438 Plant Metabolism U [0.50]

Physiological and biochemical aspects of the mechanism whereby plants sustain themselves. Emphasis will be placed on the interactions between different processes. Offered in conjunction with BOT*4380. Extra work is required of graduate students.

BOT*6601 Molecular Basis of Plant-Microbe Interactions U [0.50]

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. Also offered as ENVB*6040.

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*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*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*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.

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.

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 botany and zoology 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 botany and zoology 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*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.

IBIO*6100 Molecular Evolution U [0.50]
This course is designed to provide students with an appreciation for the uses of molecular data in the study of evolutionary processes. An overview of the principles of molecular data analysis using a phylogenetic approach will be given. In addition, the importance of incorporating evolutionary history into biodiversity research and other applied topics will be emphasized. Laboratory sessions will be devoted to practical training in analytical tools using specialized computer software, and for student presentation of independent research projects. The course will involve practical training in molecular data analysis using a phylogenetic approach and discussion of current topics from the primary literature

IBIO*6630 Scientific Communication I U [0.75]
The development and refinement of the skills of scientific communication, emphasizing writing skills, in the context of developing a thesis proposal.

IBIO*6640 Scientific Communication II U [0.25]
The development and refinement of the skills of scientific communication, emphasizing oral skills, and culminating in the defence of the thesis proposal.

Chemistry

CHEM*7100 Selected Topics in Inorganic Chemistry I U [0.50]
Discussion of specialized topics related to the research interests of members of the centre. Special topics could include, for example: bioinorganic chemistry; inorganic reaction mechanisms; synthetic methods in inorganic and organometallic chemistry; homogeneous and heterogeneous catalysis; chemistry of polynuclear compounds.

CHEM*7110 Selected Topics in Inorganic Chemistry II U [0.50]
Discussion of specialized topics related to the research interests of members of the centre. Special topics could include, for example: bioinorganic chemistry; inorganic reaction mechanisms; synthetic methods in inorganic and organometallic chemistry; homogeneous and heterogeneous catalysis; chemistry of polynuclear compounds.

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, Hückel and extended Hückel methods for molecules and clusters. Perturbation theory. Applications of group theory in inorganic chemistry; Jahn-Teller effects in molecules and solids. Energy bands in one, two and three dimensions. Prerequisites: three semester-long undergraduate courses in inorganic chemistry and one semester-long undergraduate course in quantum mechanics or group theory.

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.

CHEM*7200 Selected Topics in Analytical Chemistry I 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*7210 Selected Topics in Analytical Chemistry II 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*7220 Selected Topics in Analytical Chemistry III 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*7230 Selected Topics in Analytical Chemistry IV 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 (LLC, LSC, GPC, 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 chronamperometry, chronocoulometry, polarography, voltammetry, chronopotentiometry, coulometric titrations, flow techniques, electrochemical sensors and chemically modified electrodes.

CHEM*7290 Surface Analysis U [0.50]

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 I 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*7320 Selected Topics in Biochemistry II 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*7330 Selected Topics in Biochemistry III 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]
Mechanisms of regulation of metabolism - enzyme clusters; phosphorylation and protein kinases/phosphatases, repression and induction, protein turnover. Regulation of transcription, translation and mRNA processing. Cell cycle and control of cell division.

CHEM*7370 Enzymes U [0.50]
Mechanisms of rate enhancement. Enzyme kinetics - steady state; inhibitors; bisubstrate enzymes; fast reaction kinetics. Enzyme reaction mechanisms. Structural and genetic modification of enzymes. Catalytic antibodies. Binding processes. Multiple sites and co-operativity. Allosteric enzymes and metabolic control. Catalysis by RNA.
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.
CHEM*7400 Selected Topics in Theoretical Chemistry I 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*7410 Selected Topics in Theoretical Chemistry II 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*7420 Selected Topics in Theoretical Chemistry III 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*7430 Selected Topics in Theoretical Chemistry IV 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 I 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*7510 Selected Topics in Physical Chemistry II 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*7520 Selected Topics in Physical Chemistry III 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*7530 Selected Topics in Physical Chemistry IV 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]
Empirical analysis. Kinetic theory of gases. Potential energy surfaces. Unimolecular rates. Relaxation and steady state methods. Diffusion rates. Rates between polar molecules. Energy transfer.

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.
CHEM*7600 Selected Topics in Organic Chemistry I 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*7610 Selected Topics in Organic Chemistry II 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*7620 Selected Topics in Organic Chemistry III 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*7630 Selected Topics in Organic Chemistry IV 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. <i>Prerequisite(s):</i> 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.
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. <i>Prerequisite(s):</i> 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. <i>Prerequisite(s):</i> CHEM*7700 or equivalent.
CHEM*7730 Selected Topics in Polymer Chemistry I 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.
CHEM*7740 Selected Topics in Polymer Chemistry II 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.

CHEM*7750 Selected Topics in Polymer Chemistry III 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.

CHEM*7760 Selected Topics in Polymer Chemistry IV 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.

CHEM*7770 Selected Topics in Polymer Chemistry V 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.

CHEM*7780 Selected Topics in Polymer Chemistry VI 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.

CHEM*7790 Selected Topics in Polymer Chemistry VII 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.

CHEM*7800 Selected Topics in Polymer Chemistry VIII 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.

CHEM*7810 Selected Topics in Polymer Chemistry IX 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.

CHEM*7820 Selected Topics in Polymer Chemistry X 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.

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 Research Project (MSc) 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]****Computing and Information Science****CIS*6000 Distributed Systems U [0.50]**

The evolution of high-performance distributed computer systems. Models for distributed processing. Taxonomy and performance evaluation of multiprocessor systems. Interconnection networks. Memory and I/O system for multiprocessor architectures. Performance of distributed systems. Architectural issues of distributed database systems.

CIS*6020 Knowledge Representation and Expert Systems U [0.50]

The major features of expert systems today: a discussion of logic and rule-based systems; forward and backward chaining; frames, scripts, semantic nets and the object-oriented approach; the evaluation of expert systems and knowledge acquisition. A sizeable project is required and applications in other areas are encouraged.

CIS*6030 Advanced Database Systems U [0.50]

Relational database systems, advanced features of database management, concurrency protocols, data integrity, transaction management, distributed databases, remote access, data warehousing, data mining, and deductive databases.

CIS*6040 Advanced Image Analysis U [0.50]

An insight into advanced topics in image processing and analysis. A study of methods for analyzing and interpreting information from two and three-dimensional images obtained from a variety of medical and biological imaging modalities.

CIS*6050 Advanced Neural Networks: Dynamical Recurrent Networks U [0.50]

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

CIS*6060 Bioinformatics U [0.50]

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

CIS*6070 Discrete Optimization U [0.50]

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

CIS*6080 Genetic Algorithms U [0.50]

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

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

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

CIS*6100 Parallel Processing Architectures U [0.50]

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

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

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

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

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

CIS*6140 Software Engineering U [0.50]

An introduction to the field of software engineering. Course covers issues such as requirements analysis, specifications, software architectures, quality assurance, and software metrics.

CIS*6150 Complexity of Parallel Computation U [0.50]

Computing models, sequential model, complexity models, evolution of parallelism, parallel complexity, P-completeness, survey of P and NC, open problems.

CIS*6160 Multiagent Systems U [0.50]

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

CIS*6200 Design Automation in Digital Systems U [0.50]
Techniques and software tools for design of digital systems. Material covered includes high-level synthesis, design for testability, and FPGAs in design and prototyping.
CIS*6320 Image Processing Algorithms and Applications U [0.50]
Brightness transformation, image smoothing, image enhancement, thresholding, segmentation, morphology, texture analysis, shape analysis, applications in medicine and biology.
CIS*6420 Artificial Neural Networks U [0.50]
Neural networks, artificial intelligence, connectionist model, back propagation, resonance theory, sequence processing, software engineering concepts.
CIS*6450 Software Systems Development and Integration U [0.25]
Techniques and tools used in the development of large software systems. Methods for organizing and constructing modular systems, manipulating files, an introduction to interface design, and use of databases. Software tools for managing projects, database connectivity, configuration management, and system application programmer interfaces.
CIS*6490 Analysis and Design of Computer Algorithms U [0.25]
The design and analysis of efficient computer algorithms: standard methodologies, asymptotic behaviour, optimality, lower bounds, implementation considerations, graph algorithms, matrix computations (e.g. Strassen's method), NP-completeness.
CIS*6650 Topics in Computer Science I U [0.50]
This special topics course examines selected, advanced topics in computer science that are not covered by existing courses. The topic(s) will vary depending on the need and the instructor.
CIS*6660 Topics in Computer Science II U [0.50]
This is a reading course. Its aim is to provide background knowledge to students who need to get a head-start in their thesis research fields early during their program while no suitable regular graduate courses are offered. Admission is under the discretion of the instructor.
<i>Restriction(s):</i> Requires instructor's signature.
CIS*6890 Technical Communication and Research Methodology F-W [0.50]
This course aims to develop students' ability in technical communication and general research methodology. Each student is expected to present a short lecture, review a conference paper, write a literature survey and critique fellow students' talks and lectures.

Clinical Studies

CLIN*6010 Clinical Medicine F [0.50]
These are in-service clinical training courses based on case material presented to the student in the Veterinary Teaching Hospital. Under supervision, the student is expected to take primary responsibility for case management including decisions related to diagnosis, therapy and client/referring veterinarian communications. Case material studied in each course reflects a different clinical subspecialty commonly occurring in the fall (F), winter (W), and spring (S) semesters respectively.
CLIN*6030 Clinical Medicine W [0.50]
These are in-service clinical training courses based on case material presented to the student in the Veterinary Teaching Hospital. Under supervision, the student is expected to take primary responsibility for case management including decisions related to diagnosis, therapy and client/referring veterinarian communications. Case material studied in each course reflects a different clinical subspecialty commonly occurring in the fall (F), winter (W), and spring (S) semesters respectively.
CLIN*6031 Clinical Medicine S [0.50]
These are in-service clinical training courses based on case material presented to the student in the Veterinary Teaching Hospital. Under supervision, the student is expected to take primary responsibility for case management including decisions related to diagnosis, therapy and client/referring veterinarian communications. Case material studied in each course reflects a different clinical subspecialty commonly occurring in the fall (F), winter (W), and spring (S) semesters respectively.
CLIN*6170 Clinical Surgery F [0.50]
These are in-service clinical training courses based on case material presented to the student in the Veterinary Teaching Hospital. Under supervision, the student is expected to take primary responsibility for case management including decisions related to diagnosis, therapy and client/referring veterinarian communications. Case material studied in each course reflects a different clinical subspecialty occurring in fall (F), winter (W), and spring (S) semesters respectively. The student is required to prepare a paper for publication in a recognized peer review journal based on clinical case material presented to the teaching hospital. As an alternative, the paper can be an in-depth review article on a clinically relevant topic.

CLIN*6180 Clinical Surgery W [0.50]
These are in-service clinical training courses based on case material presented to the student in the Veterinary Teaching Hospital. Under supervision, the student is expected to take primary responsibility for case management including decisions related to diagnosis, therapy and client/referring veterinarian communications. Case material studied in each course reflects a different clinical subspecialty occurring in fall (F), winter (W), and spring (S) semesters respectively. The student is required to prepare a paper for publication in a recognized peer review journal based on clinical case material presented to the teaching hospital. As an alternative, the paper can be an in-depth review article on a clinically relevant topic.
CLIN*6181 Clinical Surgery S [0.50]
These are in-service clinical training courses based on case material presented to the student in the Veterinary Teaching Hospital. Under supervision, the student is expected to take primary responsibility for case management including decisions related to diagnosis, therapy and client/referring veterinarian communications. Case material studied in each course reflects a different clinical subspecialty occurring in fall (F), winter (W), and spring (S) semesters respectively. The student is required to prepare a paper for publication in a recognized peer review journal based on clinical case material presented to the teaching hospital. As an alternative, the paper can be an in-depth review article on a clinically relevant topic.
CLIN*6190 Neurology F [0.50]
Basic principles of lesion localization in the domestic species with discussions of diagnostic problems in veterinary neurology. Offered alternate years.
CLIN*6200 Concepts and Application of Infection Control U [0.50]
This course will involve principles of infection control in veterinary hospitals, drawing heavily from information from human medicine and evaluating human information in a veterinary context.
CLIN*6270 Applied Surgical Principles U [0.25]
General surgical principles associated with surgical and related treatment of various body systems. This is an applied course with laboratory and written components. Prerequisite: must have prior surgical training.
CLIN*6310 Advanced Equine Veterinary Orthopaedics U [0.50]
This course will provide the student with an in-depth understanding of orthopaedic practice and will facilitate revision of materials to prepare board certification.
<i>Prerequisite(s):</i> DVM or BSc
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 W [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.
CLIN*6380 Electrocardiography in Domestic Animals F,W,S [0.50]
This course will deal with the study of the electrocardiography of the cat, dog, cow and horse. Students will review the mechanisms of arrhythmogenesis and the role of anti-arrhythmic agents in the control of arrhythmogenesis.
CLIN*6420 Anesthesiology I S [0.50]
A course in advanced veterinary anesthesia and allied topics such as fluid, acid-base, and electrolyte balance, shock therapy, and cardio pulmonary resuscitation.
CLIN*6440 Anesthesiology II F,W,S [0.50]
A discussion, reading and investigative course on research methods in comparative anesthesiology. Course CLIN*6420 is normally a prerequisite.
CLIN*6550 Small Animal Internal Medicine I F [0.50]
This is a graduate course designed for DVSc students and residents pursuing further study in the area. The basis of the course is the acquisition and application of knowledge of the pathophysiologic mechanisms of disease. Subject areas to be addressed may include: cardiovascular disease, respiratory disease and acid-base-electrolyte abnormalities.
CLIN*6560 Small Animal Internal Medicine II W [0.50]
A continuation of Small Animal Internal Medicine I. Subject areas to be addressed may include: endocrine diseases, pharmacodynamics, renal disease and neurologic disease.

CLIN*6570 Large Animal Internal Medicine I S [0.50]
Advanced study in general medicine and pathophysiologic principles of disorders of the gastrointestinal and urinary systems in ruminants, swine and horses. Offered every third year.
CLIN*6580 Large Animal Internal Medicine II S [0.50]
Advanced study in general medicine and the pathophysiologic principles of disorders of the cardiovascular, respiratory and musculo-skeletal systems of ruminants and horses. Offered every third year.
CLIN*6590 Large Animal Internal Medicine III S [0.50]
Advanced study in general medicine and the pathophysiologic principles of neonatal disorders and disorders of the nervous system, skin and general systemic disorders. Offered every third year.
CLIN*6600 Equine Soft Tissue Surgery I F,W,S [0.50]
Based on required reference reading, every other week discussion will cover advanced soft tissue procedures performed in equine surgery. Guest lectures on selected topics will be presented. Laboratory will be given.
CLIN*6610 Equine Soft Tissue Surgery II F,W,S [0.50]
Based on required reference reading, every other week discussion will cover advanced soft tissue procedures performed in equine surgery. Guest lectures on selected topics will be presented. Laboratory will be given.
CLIN*6620 Ruminant Surgery W [0.50]
Through lectures/seminars, medical and surgical laboratories, and detailed case discussions, this course provides practical experience in ruminant medical, radiological and surgical procedures and in problem-solving related to ruminant practice.
CLIN*6680 Readings in Cardiology I F,W,S [0.50]
Original articles, review articles and textbook chapters dealing with the most recent concepts of pathophysiology, diagnostic procedures and therapeutic advancements will be reviewed, analyzed and discussed.
CLIN*6690 Readings in Cardiology II F,W,S [0.50]
Readings in Cardiology II will be a continuation of the format of Readings in Cardiology I with further readings in clinical cardiology.
CLIN*6700 Pathophysiology in Small Animal Surgery I F,W,S [0.50]
Based on required reference reading, weekly discussions will cover the disease mechanisms involved in medical problems commonly encountered in small animal surgical practice. Guest lectures on selected topics will be presented.
CLIN*6710 Pathophysiology in Small Animal Surgery II F,W,S [0.50]
Based on required reference reading, weekly discussions will cover the disease mechanisms involved in medical problems commonly encountered in small animal surgical practice. Guest lectures on selected topics will be presented.
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 spring semesters respectively.
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 spring semesters respectively.

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 spring semesters respectively.
CLIN*6950 Special Topics in Clinical Studies F,W,S [0.50]

Marketing and Consumer Studies

COST*6000 Consumption Behaviour Theory F [0.50]
A review of the nature and scope of consumption behaviour and the approaches to studying the role of human consumption using the major theoretical perspectives.
COST*6010 Product Development and Management Systems U [0.50]
The development of organizational technology and innovation strategy; product/market-strategy formulation; issues associated with product development, product management and consumer affairs.
COST*6020 Marketing Strategy & Decision Support Systems U [0.50]
The application of knowledge about consumer behaviour, markets, research, problem-solving approaches, and concepts and principles of marketing to the analysis of marketing situations and problems, and the formulation of marketing strategy and policy. Includes the use of marketing-decision support systems, simulations and models for strategy formulation and decision making for product development, test marketing, and marketing-mix decisions.
COST*6050 Research in 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.
COST*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.
COST*6080 Qualitative Methods for Consumer Research W [0.50]
A review of the nature, importance and validity issues associated with qualitative research. Topics include theory and tactics in design, interpersonal dynamics, analysis of interaction and transcripts.
COST*6090 Special Topics in Consumer Research and Analysis U [0.50]
COST*6120 Marketing Management U [0.50]
A study of marketing decision-making with emphasis on the formulation of strategic marketing plans.
COST*6150 Quality Assurance Management U [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.
COST*6260 Special Topics in Food Marketing U [0.50]
COST*6300 Special Topics in Consumer Studies U [0.50]
COST*6310 Retail Systems and Strategy U [0.25]
The analysis and evaluation of evolving retailing systems. Topics include retail structure and strategy, environmental change and retail adaptation, location analysis and operation management.
COST*6320 Promotion Management U [0.25]
A review of the concepts, principles and theory of promotion and promotion management. Topics include the structure of the promotion and advertising industry, consumer decision-making, information processing, response to promotion, copy development, media selection, and evaluation.
COST*6350 Consumer, Business and Government Relations F,W [0.25]
The development of an original and critical perspective to major issue development and macro-level-policy formation processes concerned with business and government interfaces, business and consumer interfaces, and Canadian and international product/service standards, which provide structure for issue management and policy development.

COST*6370 Consumer Economics U [0.50]
An applied economics course focusing on aggregate consumption at the domestic/international level; financial and time allocation at the individual/household level; theoretical, mathematical and econometric analysis of consumption; applications to contemporary consumption issues and problems.
COST*6700 Special Topics in International Marketing U [0.50]
COST*6710 Special Topics in Marketing U [0.50]
COST*6720 Special Topics in Housing and Real Estate U [0.50]
COST*6950 Consumer Studies Seminar F,W [0.00]

Drama

DRMA*6010 Approaches to Research and Theory U [1.00]
Introduces methodologies of graduate-level scholarship through a series of modules. Module 1 (required) focuses on a common text of imaginative literature, to introduce a range of theoretical and interpretative strategies and research tools. Subsequent modules (of which two are required) focus on particular issues in the study of literature and performance. NOTE: This course is offered over the fall and winter semesters. Students must register for both the fall and winter offerings of the course. They will receive an INP ("in progress") grade at the end of the fall semester and a final grade at the end of the winter semester.
DRMA*6020 Canadian Drama in English U [0.50]
Studies of Canadian scripts written in English, providing opportunities for detailed analyses of particular writings, periods or genres in their social and cultural contexts.
DRMA*6040 Quebec and Franco-Canadian Drama U [0.50]
Studies in Quebec and Franco-Canadian scripts written in French, providing opportunities for detailed analyses of particular writings, periods, or genres in their social and cultural contexts.
DRMA*6050 Special Studies in Canadian Drama U [0.50]
Detailed study of a particular aspect of Canadian drama, providing opportunities for the student to pursue in depth an area of specialized research.
DRMA*6060 Aspects of Canadian Theatre History U [0.50]
A seminar on selected aspects of history of theatre as a practice and an institution in Canada.
DRMA*6080 Special Studies in Canadian Theatre U [0.50]
A detailed study of some particular aspect of Canadian theatre, providing opportunities for the student to pursue in depth an area of specialized research.
DRMA*6090 Aspects of Theatre in Early-Modern England U [0.50]
A seminar on selected aspects of the theatre of the 16th- and early 17th-centuries in England.
DRMA*6100 English Drama to 1642 U [0.50]
Studies of selected scripts from the 16th- and early 17th-century in England, providing opportunities for detailed analyses of particular writings, periods, or genres in their social and cultural contexts.
DRMA*6120 Aspects of 20th-Century Theatre U [0.50]
A seminar on selected aspects of theatre in the 20th century.
DRMA*6130 Aspects of 19th-Century Drama U [0.50]
Studies of selected scripts from the 19th century, providing opportunities for detailed analyses of particular writings, periods, or genres in their social and cultural contexts
DRMA*6140 Aspects of 20th-Century Drama U [0.50]
Studies of selected scripts from the 20th century, providing opportunities for detailed analyses of particular writings, periods, or genres in their social and cultural contexts.
DRMA*6150 Special Studies in Theatre History U [0.50]
Detailed study of a particular aspect of theatre history, providing opportunities for the student to pursue in depth an area of specialized research.
DRMA*6180 Aspects of 19th-Century Theatre U [0.50]
A seminar on selected aspects of theatre in the 19th century.
DRMA*6190 Special Studies in Drama U [0.50]
Detailed study of a particular aspect of dramatic literature, providing opportunities for the student to pursue in depth an area of specialized research.

DRMA*6220 Aspects of the Theory of Drama, Theatre, and Performance U [0.50]
Studies of selected theories of drama, theatre, and performance, and of particular theoretical issues and approaches.
DRMA*6280 Independent Reading Course U [1.00]
Independent Reading Course
DRMA*6500 Research Paper U [1.00]
DRMA*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.
DRMA*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.

Economics

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.
<i>Prerequisite(s):</i> ECON*6000.
ECON*6020 Macroeconomic Theory I U [0.50]
A first graduate course in macroeconomics, presenting a rigorous treatment of aggregate consumption, investment, government budgets, money demand and supply, aggregate demand, aggregate supply, inflation and unemployment, and open economy issues.
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.
<i>Prerequisite(s):</i> ECON*6020
ECON*6050 Introduction to Econometric Methods U [0.50]
Introduction to the specification, estimation and testing of economic models. Topics include the classical linear regression model, t tests, structure tests, specification error, the consequences of the violation of the classical assumptions, detection and correction of autocorrelation and heteroscedasticity.
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.
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 variable models, and issues in time series analysis.
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*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*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*6350 Economic Development U [0.50]

This course examines economic development from an international perspective: theories, history, policies and prospects.

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.

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*6490 Monetary and Finance Theory U [0.50]

This course examines selected topics in monetary and finance theory. Topics may include: contingent claims markets, arbitrage asset-pricing, portfolio models, firm capital structure, government debt, real business cycles, cash-in-advance models, spatial money models, overlapping generations models, and traditional models of the demand and supply of money and monetary policy.

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.

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.

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.

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 Economics of Non-Renewable Resources 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.

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 Graduate Program Services.

Environmental Design and Rural Development**EDRD*6000 Qualitative Analysis in Rural Development U [0.50]**

Nature and use of qualitative data collection and analysis techniques by practitioners in the planning, implementation and evaluation of rural planning and development activities in both domestic and international settings.

Prerequisite(s): RPD*6170 or REXT*6260 or LARC*6610

Engineering**ENGG*6000 Advanced Heat and Mass Transfer F [0.50]**

Basic physical principles of transport phenomena. Heat and mass transfer methods for physical systems. Time and volume averaging. Dimensional analysis.

ENGG*6020 Advanced Fluid Mechanics U [0.50]

Laminar and turbulent flow. Turbulence and turbulence modelling. Boundary-layer flow. Compressible flow. Potential flow.

ENGG*6030 Finite Difference Methods W [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 W [0.50]

Boundary-value problems. Methods of approximation. Time dependent problems. Isoparametric elements. Numerical integration. Computer implementation. Mesh generation and layouts. Two-dimensional finite elements.

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*6070 Medical Imaging W [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*6080 Engineering Seminar W [0.50]

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 W [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.

ENGG*6100 Machine Vision F [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*6110 Food and Bio-Process Engineering W [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 F [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 F [0.50]
Rheology and rheological properties. Contact stresses between bodies in compression. Mechanical damage. Aerodynamic and hydro-dynamic characteristics. Friction.
ENGG*6140 Optimization Techniques for Engineering W [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*6150 Bio-Instrumentation W [0.50]
Instrumentation systems. Transducers. Amplifier circuits. Recording methods. Spectroscopy & colorimetry. Radiation, humidity, pH and noise measurements. Chromatography.
ENGG*6160 Advanced Food Engineering F [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.
ENGG*6190 Special Topics in Biological Engineering W [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*6440 Advanced Biomechanical Design F [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.
ENGG*6540 Advanced Robotics W [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 W [0.50]
Soft real-time systems, hard real-time systems, embedded systems, time handling and synchronization, deadlines, preemption, interruption, rts languages, rts/operating systems, system life-cycle, petri nets, task scheduling and allocation, fault-tolerance, resource management, rts/search techniques, dealing with uncertainty.
ENGG*6560 Advanced Digital Signal Processing W [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 F [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.
<i>Prerequisite(s):</i> ENGG*4430 or equivalent

ENGG*6580 Advanced Control Systems F [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 infinite control and uncertainty and robustness in control systems will be addressed. .
ENGG*6610 Urban Stormwater Management W [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, radial 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 F [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 W [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 W [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 W [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*6670 Hazardous Waste Management F [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 F [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 F [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 selection of management approaches for various types of receiving water.
ENGG*6740 Ground Water Modelling W [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*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*6800 Deterministic Hydrological Modelling W [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]
Distribution function selection for historic hydrologic data representation. Monte Carlo simulation techniques. ARMA modelling of hydrologic processes. Regional analysis. Risk analysis.
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 W [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]
Analytical decision making. Optimization methods. Planning under uncertainty. Deterministic river basin modelling. Irrigation planning and operation. Water quality management modelling.
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.
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.
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.

English

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*6010 Approaches to Research and Theory U [1.00]
Introduces methodologies of graduate-level scholarship through a series of modules. Module 1 (which is required) focuses on a common text of imaginative literature, to introduce a range of theoretical and interpretative strategies and research tools. Subsequent modules (of which two are required) focus on particular issues in the study of literature and performance. NOTE: ENGL*6010 is offered over the Fall and Winter semesters and students must therefore register for the course in both Fall and Winter. They will receive an INP ("in progress") grade at the end of the Fall, and a final grade at the end of the Winter. NOTE: ENGL*6010 is offered over the Fall and Winter semesters and students must therefore register for the course in both Fall and Winter. They will receive an INP ("in progress") grade at the end of the Fall, and a final grade at the end of the Winter.

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 Commonwealth/Postcolonial 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]
A examination of the literature of Britain between the 17th century and the latter part of the 18th century. Topics may focus on a single author, a specific genre, or relationships between the literary and the cultural.
ENGL*6421 Topics in Eighteenth Century and Romantic Literature U [0.50]
A examination of the literature of Britain between the 17th century and the latter part of the 18th century. Topics may focus on a single author, a specific genre, or relationships between the literary and the cultural.
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.
ENGL*6451 Topics in American Literature U [0.50]
Topics may include a focus on a single region, such as the American West, on a single time period, such as the Civil War, on a specific genre, such as the novels of frontier women, or other issues in American literary studies.
ENGL*6611 Topics in Women's Writing U [0.50]
In the past the course has dealt with Victorian women poets, with the place of women in the literature of the American West, and with other issues of interest to students of women's writing and the broader issues of feminist theory.
ENGL*6621 Topics in Children's Literature U [0.50]
Past offerings have involved a focus on a specific author - such as Lucy Maud Montgomery - or on a specific kind of writing for or by children.
ENGL*6641 Topics in Scottish Literature U [0.50]
Courses under this rubric are concerned with the various literatures produced by Scots both within and beyond the boundaries of Scotland. The course could involve the study of a specific genre, the investigation of a specific theme, or the examination of a particular author over the course of her/his career.
ENGL*6691 Interdisciplinary Studies U [0.50]
Designed to provide the opportunity to explore alternative fields and modes of critical inquiry, this variable-content course will study the relationship between literary study and other forms of intellectual inquiry such as the relationship between literature and sociology, between critical theory and psychology, between literary history and historical fact.
ENGL*6801 Reading Course I U [0.50]
An independent study course, the nature and content of which is agreed upon between the individual student and the person offering the course. Subject to the approval of the student's advisory committee and the graduate committee.
ENGL*6802 Reading Course II U [0.50]
An independent study course, the nature and content of which is agreed upon between the individual student and the person offering the course. Subject to the approval of the student's advisory committee and the graduate committee.

ENGL*6803 Research Project U [1.00]

An independent study course, the content of which is agreed upon between the individual student and the person offering the course. Subject to the approval of the student's advisory committee and the Graduate 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.

ENGL*6811 Special Topics in English U [0.50]

Depending on the research interests of the instructor, courses under this rubric explore topics in the study of literature that do not fall neatly under the rubrics above. In the past the course has dealt with literature and aging, and with issues in the field of popular culture.

Environmental Biology**ENVB*6040 Molecular Basis of Plant-Microbe Interactions F [0.50]**

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.

ENVB*6060 Topics in Phytopathology W [0.50]

Current topics and emerging issues in phytopathology and plant health will be examined through presentations, discussions and group projects. Emphasis will be placed on ecology, population biology and genetics of plant pathogens and other microorganisms, and their application to current practices in plant health.

ENVB*6080 Plant Disease Epidemiology and Management W [0.50]

Epidemiology and management of plant diseases caused by fungi, viruses, and bacteria. (Offered in alternate years.)

ENVB*6180 Physiology and Biochemistry of Herbicides W [0.50]

Chemical and biological fate of herbicides in soil. Physical, morphological and physiological factors influencing herbicidal selectivity and modes of action. (Offered in alternate years.) Department of Environmental Biology

ENVB*6190 Environmental Microbial Technology W [0.50]

Current topics in selected areas of environmental microbial technology. An emphasis will be placed on the physiology and genetics of microorganisms useful in environmental biotechnology. The course involves extensive use of current journal articles.

Restriction(s): Undergraduate degree in microbiology or related discipline.

ENVB*6340 Colloquium in Insect Systematics W [0.25]

Weekly discussions and seminars dealing with current topics in systematic entomology.

ENVB*6370 Physiology of Insects F [0.50]

Students will be assigned a library exercise and will select a laboratory project in their own area of interest. Emphasis will be placed on techniques and familiarity with current literature.

ENVB*6451 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: plant protection and environmental management. This course may be offered in any of lecture, reading/seminar, or individual project formats.

ENVB*6452 Topics in Environmental Biology F,W,S [0.50]

See ENVB*6451 above.

ENVB*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.)

ENVB*6530 Ecotoxicological Risk Characterization W [0.50]

A biologically based advanced course that will give students working knowledge of current procedures and techniques for ecotoxicological risk characterization. The course material will cover the topics: problem definition, dose response characterization, exposure characterization, and risk assessment and risk-management decision making. (Credit may be obtained for only one of TOX6530, ENVB6530 and TOX4550.) Department of Environmental Biology

ENVB*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.

ENVB*6550 Bioactivity and Metabolism of Pesticides W [0.50]

The basis 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).

ENVB*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.

ENVB*6620 Management and Biology of the Honey Bee F [0.50]

An in-depth treatment of advanced topics related to honey bees, including management techniques such as wintering bees, queen rearing and instrumental insemination, comb-honey production, genetics and breeding of honey bees, caste determination, and social behaviour of honey bees. Discussion sections will focus on recent research.

ENVB*6710 Introductory Seminar F [0.25]

This course provides information and training in various scientific presentation styles - written, computer generated, oral, and poster formats. Students will prepare a scientific essay based on research they have conducted and subsequently transform the essay into an oral and a poster format.

ENVB*6720 Advanced Seminar W [0.25]

Graduate students will prepare either an oral or a poster presentation on their thesis research. They will also be responsible for participating in the organization of a departmental graduate student symposium during which their presentations will be given and evaluated. Students must also attend weekly departmental seminars and prepare 5 précis for evaluation.

Fine Art**FINA*6510 Introduction to Graduate Studio F [1.50]**

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.

FINA*6515 MFA Studio I W [1.50]

Sustained work at an independent level under the supervision of the chair of the student's advisory committee.

Prerequisite(s): FINA*6510.

FINA*6530 MFA Teaching Practicum I F [0.50]

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.

FINA*6531 MFA Teaching Practicum II F [0.50]

Continuation of teaching practicum under the guidance of a faculty member. The practicum seminar will consider theoretical and practical issues relevant to the teaching of studio art such as educational goals, course and curriculum planning, academic evaluation, health and safety policies, and appropriate materials and equipment.

Prerequisite(s): FINA*6530

FINA*6540 MFA Seminar I F [0.50]

Examination of critical issues in the visual arts relevant to studio practice

FINA*6545 MFA Seminar II W [0.50]

Continuation of issues examined in FINA*6540.

Prerequisite(s): FINA*6540.

FINA*6550 Selected Topics in Fine Art U [0.50]

Seminar in a fine art topic in a subject to be specified by the instructor.

Prerequisite(s): Admission to the MFA program.

FINA*6551 Seminar in Art Theory and Criticism I W [0.50]

Selected topics in art theory and criticism with particular relevance to studio practice.

Prerequisite(s): Admission to MFA program or permission of instructor.

FINA*6552 Seminar in Canadian Art U [0.50]

Selected topics in Canadian Art

Prerequisite(s): Admission to the MFA program and permission of instructor.

FINA*6554 Seminar in Nineteenth Century Art U [0.50]

Selected topics of the period.

Prerequisite(s): Admission to the MFA program and permission of instructor.

FINA*6555 Seminar in Twentieth Century Art U [0.50]
Selected topics of the period. <i>Prerequisite(s):</i> Admission to MFA program and permission of instructor.
FINA*6610 MFA Studio II F [1.50]
Continuation of FINA*6515 <i>Prerequisite(s):</i> FINA*6515
FINA*6615 MFA Studio III W [1.50]
Continuation of FINA*6610 <i>Prerequisite(s):</i> FINA*6610
FINA*6640 MFA Seminar III F [0.50]
Continuation of FINA*6545 <i>Prerequisite(s):</i> FINA*6545
FINA*6641 MFA Seminar IV W [0.50]
Continuation of FINA*6640.
FINA*6650 Individual Study in Art History U [0.50]
Students will pursue special study under the guidance of a faculty member with appropriate expertise <i>Prerequisite(s):</i> Approval of the co-ordinator of the MFA program.
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 <i>Prerequisite(s):</i> Approval of the co-ordinator of the MFA program.
FINA*6652 Individual Study in Art Theory and Criticism W [0.50]
Students will pursue special study under the guidance of a faculty member with appropriate expertise. <i>Prerequisite(s):</i> Approval of the co-ordinator of the MFA program.

Food Science

FOOD*6110 Food Rheology U [0.50]
Mechanical properties of foods. Application of the principles of rheology to food materials. Relationship between texture and microstructure. Instrumental measurement of food texture. Principles of measurement systems for different types of foods. Interpretation of force-deformation diagrams. Texture modification. Texture profile analysis.
FOOD*6120 Fruit and Vegetable Technology F [0.50]
A course that deals with the current status of technologies based on fruits and vegetables. The subject coverage will include post harvest storage, the parameters that determine quality, biochemical and molecular strategies for improving storage life and quality, processing technologies and issues related to genetic engineering, food safety, functional food ingredients and their health-regulatory function.
FOOD*6160 Chemistry of Food Lipids U [0.50]
Composition and function of lipids in food systems. Analytical procedures used in isolating, identifying and quantifying lipid components. Lipid classes and their properties. Polyunsaturated lipids and their reactions. Physical properties of lipids and instrumental methods of analysis. Industrial processing including hydrogenation, fractionation, interesterification and enzymic processes. Biotechnology of lipids.
FOOD*6170 Chemistry of Food Proteins U [0.50]
This course deals with theoretical and practical approaches to food proteins including their analysis. The following topics will be covered: physiochemical properties of proteins/amino acids, quantification of protein/amino acids, protein structure analysis, protein denaturation, chemical modification/genetic engineering and structure-functional properties of food proteins. In addition, food protein systems such as muscle, eggs, milk and vegetable proteins will be discussed.
FOOD*6190 Advances in Food Science U [0.50]
Topics of current research interest and importance are examined. A project supervised by a faculty member is undertaken, the topic of which is chosen after considering the interests of the student.
FOOD*6210 Chemistry of Food Carbohydrates U [0.50]
This course is designed to familiarize students with the principles of carbohydrate chemistry. It focuses on the structural and functional characteristics of food carbohydrates - both sugars and polysaccharides - their analysis and applications in various food systems.

FOOD*6220 Advanced Food Analysis Methodology U [0.50]
Theory and practical applications of modern analytical techniques. Topics covered include differential scanning calorimetry, spectroscopy, gas liquid chromatography, high performance liquid chromatography and microscopy as well as various spectroscopic techniques (e.g. UV, fluorometry, circular dichroism).
FOOD*6260 Food Colloids U [0.50]
Principles of colloid science as applied to foods that contain small particles, e.g., emulsions, foams. Methods for studying colloidal particles in food materials. Manufacture, structure, properties and stability of food colloids, e.g., oil-in-water emulsions, water-in-oil emulsions, milk and dairy products. Use of food emulsifiers.
FOOD*6270 Applied Enzymology and Biotechnology U [0.50]
A lecture course dealing with principles of modern enzymology and biotechnology and their application in food science and food industry. Typical topics include - enzymes in biotechnology; basics of enzyme kinetics; enzymes in recombinant DNA technology; enzymes in analysis (ELSA, DNA-probes, reporter genes, microbial analysis); enzymes in food production, food analysis.
FOOD*6280 Rapid Methods in Food Microbiology U [0.50]
The course is designed to update knowledge of modern methods for the microbiological analysis of foods. Theory and practical applications are discussed. Methods reviewed include bioluminescence, impedimetry, immunological techniques, gene probes and other emerging technologies.
FOOD*6300 Seminar U [0.50]
Each student must present a seminar on an assigned topic or a topic related to his/her research project as well as participate in the seminars of colleagues and faculty.
FOOD*6350 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. Offered jointly with HBNS*6410. <i>Prerequisite(s):</i> HBNS*6400
FOOD*6410 Advanced Oenology U [0.50]
A comprehensive and advanced treatise, by lectures and practice, of all aspects involved in the production of white and red table wines. Special attention is given to the basic principles involved in the vintification process as they relate to cellar technology.
FOOD*6600 Advanced Food Microbiology U [0.50]
This course will review current issues in food microbiology. Topics to be covered will include the microbial ecology of food, factors affecting the growth and survival of microorganisms in foods, and strategies for the production of safe food.
FOOD*6620 Industrial Microbiology U [0.50]
Applications of Molecular Genetics and Biotechnology to industrial microbial processes including the production of organic acids, amino acids, antibiotics, ethanol, and solvents. There is extensive coverage of the fermentation industries: baking, brewing, vinting and spirit production.
Family Relations and Applied Nutrition
FRAN*6030 Quantitative Research Methods U [0.25]
This module focuses on how to critically appraise the quantitative research literature and design and applied quantitative study. The module examines the logic and steps involved in conducting research, research ethics, measurement issues, survey design, experimental and quasi-experimental designs, cross-sectional and longitudinal designs, and sampling <i>Restriction(s):</i> Available only to FRAN graduate students
FRAN*6040 Introduction to Qualitative Methods U [0.25]
This module focuses on the design of a qualitative research project with attention given to theory-method linkages, researcher roles and data collection methods. <i>Restriction(s):</i> Available only to FRAN graduate students
FRAN*6050 Qualitative Analysis U [0.25]
This module focuses on analysis procedures when working with qualitative data. Attention will be given to different forms of analysis, use of analytic memos, theoretical sampling and generating theory. Instructor's signature required.
FRAN*6070 Sexual Issues and Clinical Interventions Across the Life Span U [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. <i>Restriction(s):</i> Signature required.

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 year to year.

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 U [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.

Prerequisite(s): FRAN*6090

Restriction(s): Available only to students in the Couple and Family Therapy program

FRAN*6100 Clinical Issues in Couple and Family Therapy U [0.50]

This course features selected clinical issues each semester; examination of each issue will include the socio-cultural context, theoretical location, and conceptual and practical implications for couple and family therapy.

Co-requisite(s): FRAN*6090

Restriction(s): Available only to students in the Couple and Family Therapy program

FRAN*6120 Theories and Methods of Family Therapy I U [0.50]

This course will offer an historical perspective on the development of the field of couple and family therapy beginning with family systems therapy, through intergenerational models, to current constructionist approaches. Intervention methods consistent with these conceptual frameworks are examined.

FRAN*6130 Theories and Methods of Family Therapy II U [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.

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 Facilitation in Family Functioning U [0.50]

A systemic exploration of family processes to understand diversity in family structures and functioning. This course has an applied focus on developing basic facilitation, communication and observational skills for exploring family structure and functioning. Students participate in learning groups supporting the development of these skills.

FRAN*6180 Research in Couple and Family Assessment and Intervention W [0.50]

The focus of this course is on research, assessment and intervention with couples and families across the lifespan.

Restriction(s): FRAN graduate students only.

FRAN*6200 Research Topics in Family Relations and Human Development U [0.50]

Contemporary research in family relations and human development.

Restriction(s): Available only to FRAN graduate students.

FRAN*6210 Program Evaluation in Child and Family Services 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. Group involvement in an actual program evaluation is a requirement for the course.

FRAN*6220 Family, Interpersonal and Social Issues in Mid and Later Life U [0.50]

This course examines conceptual, methodological and policy issues involving inter- and intra-generational family and social relationships throughout mid and later life.

FRAN*6221 Concepts and Strategies of Primary Prevention U [0.50]

The course explores selected concepts and strategies of primary prevention. Students examine research and current practice related to individual and family health and well-being, including education, community organization, competency promotion, natural care giving, and consultation.

FRAN*6260 Practicum U [0.50]

Supervised practicum experience in a variety of agencies or services. 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.

FRAN*6270 Issues in Family-Related Social Policy U [0.50]

This course investigates definitions of social policy, comparative family-related social policy, selected issues in Canadian family policy and frameworks for analysis of social policy. Issues in policy-related research are also explored.

FRAN*6280 Theorizing in Family Relations and Human Development U [0.50]

An examination of the meaning of science and theory in relation to the study of families and human development. Included is a discussion of the major social science paradigms including positivism, critical theory, social constructionism and post-modernity. This course is designed for doctoral students.

FRAN*6300 Theories of Development and Change Across the Life Span U [0.50]

An interdisciplinary examination of sociological and psychological theories of development and change across the life span. Critical comparisons among theories with competing assumptions at different points over individual and family life cycles is discussed.

FRAN*6310 Parent-Child Relations Across the Life Span U [0.50]

Considers theory and research on parent-child interactions, relationships and intergenerational transmission across the life span. (Offered in alternate years.)

FRAN*6320 Human Sexuality Across the Life Span U [0.50]

This course covers research, theoretical and substantive issues relevant to studying human sexuality across the life span. Topics include: child and adolescent sexuality, sexual identity, sexuality in adulthood and old age, sexual assault, international research and sex education.

FRAN*6330 Research Seminar U [0.25]

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.

FRAN*6340 Interdisciplinary Perspectives in Family Relations and Human Development U [0.50]

This course acquaints students with the diverse disciplinary perspectives used in the study of family relations and human development. Substantive research issues provide a forum for integrating the separate perspectives and understanding the reciprocal relationship between individual and family growth and development.

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.

FRAN*6370 Social Development During Childhood U [0.50]

A detailed study of factors important to social competence in childhood from infancy to adolescence.

FRAN*6380 Adolescence U [0.50]

Adolescence is examined from a multidisciplinary developmental-contextualist perspective. Topics include: individual differences, development, and social and environmental contributions to adolescent psychosocial functioning.

FRAN*6410 Developmental Assessment and Intervention in Childhood and Adolescence U [0.50]

An examination of psychological difficulties encountered in childhood and adolescence. Special attention will be given to theoretical models used to explain childhood difficulties, categorization systems, assessment techniques, methods of intervention, as well as ethical issues specific to working with children and adolescence.

FRAN*6420 Introductory Applied Statistics U [0.25]

Background theory and knowledge components required to understand introductory parametric and non-parametric statistics appropriate in applied social/health science research. Students will learn conceptual and practical applications of statistical analyses with emphasis on hypothesis formation, data screening and description analysis and interpretation.

Restriction(s): Available only to FRAN graduate students

FRAN*6430 Advanced Applied Statistics I: Regression & Multivariate ANOVA Designs U [0.25]

Introduction to advanced regression modelling strategies, logistic regression analysis, multivariate analysis of variance/covariance, and repeated measures analysis of variance/covariance models appropriate in applied social/health science research. The course covers conceptual and practical applications of statistical analyses with emphasis on selection of appropriate methods and models to address complex, multi-factorial data.

Restriction(s): Available only to FRAN graduate students

FRAN*6440 Advanced Applied Statistics II: Factor Analysis U [0.25]
A theoretical and computational introduction to factor analysis as a method for understanding complex multivariate data in applied social/health science research. Principal components analysis (PCA), exploratory factor analysis (EFA), confirmatory factor analysis (CFA), and applications of structural equation modeling (SEM) will be examined. Additional topics may include scale development, multi-group analysis, and methods/concerns about measurement invariance.
<i>Restriction(s):</i> Available only to FRAN graduate students
FRAN*6450 Cultural Perspectives on the Family U [0.50]
Family relationships throughout the life span are considered drawing from the perspectives of cross-cultural psychology, cultural psychology and acculturation and diversity. Topics include the cultural context of family forms, dating and marriage, childrearing, socialization, and marital relations, parent-child relationships and intergenerational relationships.
FRAN*6510 Nutrition in the Community U [0.50]
Concepts and knowledge of nutrition as applied in community and public health nutrition. Examination of current programs in applied nutrition.
FRAN*6550 Research Seminar U [0.25]
Research literature in applied nutrition.
FRAN*6560 Special Topics in Applied Human Nutrition U [0.50]
FRAN*6600 Theoretical Perspectives in Applied Human Nutrition U [0.50]
A survey and critical analysis of theoretical frameworks from Education and the Social Sciences as they are applied to the study and understanding of human nutrition behaviour. Research issues and applications are emphasized.
FRAN*6610 Advances in Clinical Nutrition/Assessment I U [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.
FRAN*6620 Nutritional Epidemiology U [0.50]
An investigation of selected non-communicable diseases. The emphasis is on epidemiologic methods and identification of nutritional risk factors.
FRAN*6630 Advances in Clinical Nutrition/Assessment II U [0.50]
Nutritional assessment issues specific to research will be discussed in depth. Selected clinical epidemiological and health service research methodologies, including meta-analysis, will be reviewed and applied to selected emerging issues in clinical nutrition practice.
<i>Prerequisite(s):</i> FRAN*6610
FRAN*6710 Practicum in Applied Human Nutrition I U [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.
<i>Restriction(s):</i> For MAN students only.
FRAN*6720 Practicum in Applied Human Nutrition II U [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
<i>Prerequisite(s):</i> FRAN*6710
<i>Restriction(s):</i> For MAN students only.
FRAN*6730 Practicum in Applied Human Nutrition III U [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.
<i>Prerequisite(s):</i> FRAN*6720
<i>Restriction(s):</i> For MAN students only.
FRAN*6750 Final Project in Applied Human Nutrition U [0.50]
This project (usually related to an activity during the Practicum in Applied Human Nutrition) consists of a written report of an applied research project in dietetic practice or a proposal for a research project, including literature review, purpose, methodology, and analysis and analysis plan.
<i>Restriction(s):</i> For MAN students only.

Food Safety and Quality Assurance

FSQA*6000 Food Safety and Quality Assurance Seminar U [0.00]
Students are expected to present two seminars during the course, one on current advances and issues in an approved area and one on their research project. Faculty associated with the program also present seminars. Students are expected to attend all seminar sessions.
FSQA*6500 Food Safety and Quality Assurance Research Project U [1.00]
An original research project related to food safety and quality assurance which includes the preparation of a written report suitable for publication and an oral presentation of the findings to the graduate faculty.
FSQA*6600 Principles of Food Safety and Quality Assurance U [0.50]
An integrated approach to factors affecting food safety and quality including microbial and chemical contamination is provided. Major food-borne disease outbreaks are studied as examples. Modern methods of quality management to minimize contamination of processed foods is discussed.
Geography
GEOG*6060 Special Topics in Geography F [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.
GEOG*6090 Research Methods F-W [0.50]
A review of philosophies and research methods in geography. The development and presentation of a context paper and proposal for the thesis or research project. This course extends over two semesters (fall and winter)
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 F,W,S [1.00]
The preparation and presentation of a report on the research project approved in GEOG*6090.
GEOG*6200 Land Use and Agricultural Systems F,W [0.50]
Rural land uses and processes, particularly agricultural systems, their dynamics and interactions with the resource base and competing activities. Theoretical models and analytical methods related to applied questions in agricultural decision making and land use planning.
GEOG*6270 Rural Community Systems W [0.50]
Characterization and delineation of rural community systems in Canada with attention to the impact of processes of centralization and diffusion on rural economy, society and settlement. Credit may not be obtained for both GEOG*6270 and 9506020.
GEOG*6281 Environmental Resource Evaluation F [0.50]
Analysis, evaluation and management of environmental resources. Emphasis is on biophysical and socio-economic concepts and methods which offer a more comprehensive and integrative basis for environmental decisions.
GEOG*6330 Biotic Processes and Biophysical Systems U [0.50]
Investigation of biotic processes influencing the composition, structure and distribution of plant and animal communities and of approaches to biophysical systems analysis, focusing on environmental system interaction at the landscape scale.
GEOG*6340 Human-Environment Systems Analysis F [0.50]
A critical review of philosophies, concepts and analytical methods for analysis and management of systems involving the interaction of environmental processes and human spatial activity.
GEOG*6400 Urbanization and Development (alternate years) 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.
GEOG*6450 Political Identities, Territory and Territoriality(alternate years) 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.
GEOG*6500 Sedimentary Processes in Geomorphology W [0.50]
An integrated study of fluid flow and sedimentary processes in water and air, setting key elements of sediment erosion, transport and deposition within a global context.

GEOG*6610 Global Hydrology F [0.50]

An examination of global environmental hydrology including precipitation, evaporation, subsurface water and runoff. Physical processes, measurement, analytical techniques and modelling strategies will be considered in the context of global change.

Human Health and Nutritional Sciences**HBNS*6010 Seminar in Human Biology 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 HBNS MSc course work and project students only

HBNS*6020 Biodynamics F [0.50]

This course considers the integrated activities of the human organism, spanning from the cellular level to the whole body. The purpose is to further develop concepts that comprise a foundation for understanding neuromuscular and musculoskeletal systems.

HBNS*6030 Applied Ergonomics U [0.50]

Reviews selected topics in ergonomics from a multidisciplinary perspective with special reference to understanding the scientific basis of associated data gathering techniques and to practicing the necessary skills. This course is also a graduate course offering in the Department of Psychology

HBNS*6040 Research Fronts in Nutritional and Nutraceutical Sciences F [0.50]

Building on an information base in nutrition, biochemistry and physiology, the course comprises selected research topics pertaining to the importance of nutrition as a determinant of health throughout the life span. Distinction will be drawn between the metabolic basis of nutrient essentiality and the health protectant effects of nutraceuticals.

HBNS*6130 Advanced Skeletal Muscle Metabolism in Humans W [0.50]

This course examines how the energy provision pathways in human skeletal muscle and associated organs meet the energy demands of the muscle cell during a variety of metabolically demanding situations.

HBNS*6320 Advances in Human Biology and Nutritional Sciences Research S,F,W [0.50]

This course provides the student with an opportunity to study a topic of choice and involves literature research on a chosen topic. The course may stand alone (MSc thesis and PhD students) or provide the background information for an experimental approach to the topic (MSc course work and project students).

HBNS*6400 Functional Foods and Nutraceuticals F [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.

HBNS*6410 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 Functional Foods and Nutraceuticals (HBNS*6400).

HBNS*6440 Nutrition, Gene Expression and Cell Signalling (offered odd-numbered years) 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.

HBNS*6700 Nutrition, Exercise and Metabolism F [0.50]

A discussion of recent concepts in the relationships among nutrition, exercise and metabolism. Information from the molecular to the whole-animal 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.

HBNS*6710 Advanced Topics in Nutrition and Exercise W [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 HBNS*6700, the focus of this course will be to develop the student's ability to independently analyze original research investigations.

HBNS*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. (Instructor's signature required.)

HBNS*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. (Instructor's signature required.)

HBNS*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. (Instructor's signature required.)

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

History**HIST*6000 HIST*6000 Historiography I F [0.50]**

This course will introduce students to some of the essential components of the historical process as exemplified by the literature produced prior to 1914. It will also assess history as a cognitive discipline in contemporary society. While the scope of the course will extend from ancient times to the eve of World War I, emphasis will be placed on 19th-century historiography.

HIST*6020 Historiography II W [0.50]

An examination of major examples of recent historical methodology, including works in cultural and social history. The student is also expected to develop and present a thesis proposal.

HIST*6040 Special Reading Course U [0.50]

Students selecting this course should speak to individual instructors to arrive at appropriate topics.

HIST*6140 Topics in British History Since 1688 U [0.50]

Although topics vary with the expertise of individual instructors, this course encompasses the British Isles.

HIST*6150 Scottish Archival Research U [0.50]

This course will comprise of classroom teaching, practical instruction and work-placement within the Scottish Collection of the University of Guelph's Archives. It will introduce students to basic skills in the digitization of sources and teach competence in conservation, record creation and archival research.

Restriction(s): Student numbers are limited by the number of placements available in the University Archives.

HIST*6190 Topics in Scottish History I U [0.50]

This course will introduce students to selected aspects of medieval and early modern Scottish history and historiography, including the use of source materials, and practical training involving manuscripts in the University Archives.

HIST*6200 Topics in Scottish History II U [0.50]

This course will introduce students to selected aspects of modern Scottish history and historiography, including the use of source materials, and provide practical training involving manuscripts in the University Archives.

HIST*6230 Canadian History I U [0.50]

A course that examines the current historiography of selected aspects of Canadian history. Topics will vary with the expertise of individual instructors.

HIST*6280 Canadian History II U [0.50]

A course that examines the current historiography of selected aspects of Canadian history. Topics will vary with the expertise of individual instructors.

HIST*6290 Topics in North American History U [0.50]

Depending on the expertise of the instructor, this course may concentrate on either the United States or Canada, or it may select an historical theme or themes common to the larger continent.

HIST*6300 Topics in Modern Europe I U [0.50]

This seminar course will focus on selected aspects of the political and social history of Europe between 1789 and 1989. Topics to be examined will vary according to the expertise of the faculty and the interest of the students.

HIST*6310 Topics in Modern Europe II U [0.50]

This seminar course will focus on selected aspects of the political and social history of Europe between 1789 and 1989. Topics to be examined will vary according to the expertise of the faculty and the interest of the students.

HIST*6350 History of the Family U [0.50]
This course will cover a broad range of historical developments within the family, all concentrating on the interaction between the family (or elements within it) and outside authority (both formal and informal).
HIST*6360 History of Sexuality and Gender U [0.50]
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.
HIST*6370 Topics in Cultural History U [0.50]
History 6370 investigates the practices of cultural history and the utility of the cultural history paradigm in the investigation of topics including politics and power, religion, war, empire, gender, class, 'race', ethnicity, the environment, and consumption.
HIST*6380 Topics in Early Modern European History U [0.50]
This seminar course examines current issues in early modern European history as selected by instructor(s). Participants review current research and historiography, discuss the principal debates, and develop their own perspectives through encounter with primary source materials.
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*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*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*7000 Doctoral Seminar U [0.00]
This seminar will meet regularly every semester to discuss research problems and issues of professional interest.
HIST*7010 Qualifying Examination U [1.00]
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*7020 Colloquium U [1.00]
This public presentation of the student's research in the major field is assessed on the basis of 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 [1.00]
HIST*7050 First Minor Field U [0.50]
HIST*7060 Second Minor Field U [0.50]
HIST*7100 Canadian History Major Seminar U [1.00]
HIST*7120 British History Major Seminar U [1.00]
HIST*7120 Scottish History Major Seminar U [1.00]
HIST*7130 Community Studies 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*7160 Gender, Women and Family Major Seminar U [1.00]
HIST*7170 Race, Slavery, and Imperialism Major Seminar U [1.00]
HIST*7180 United States History Major Seminar U [1.00]
HIST*7600 Canadian History Minor Seminar U [0.50]
HIST*7610 British History Minor Seminar U [0.50]
HIST*7620 Scottish History Minor Seminar U [0.50]
HIST*7630 Community Studies Minor Seminar U [0.50]
HIST*7640 Early Modern European History Minor Seminar U [0.50]
HIST*7650 Modern European History Minor Seminar U [0.50]
HIST*7660 Gender, Women and Family Minor Seminar U [0.50]
HIST*7670 Race, Slavery, and Imperialism Minor Seminar U [0.50]
HIST*7680 United States History Minor Seminar U [0.50]
HIST*7690 International History Minor Seminar U [0.50]
HIST*7700 Science, Medicine and Technology Minor Seminar U [0.50]
HIST*7710 Other Minor Seminar U [0.50]
HIST*7990 HIST*7990 U [2.00]

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.
HTM*6110 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.
<i>Restriction(s):</i> Non MBA students only by permission of instructor.
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.
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.
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.
<i>Restriction(s):</i> Non MBA students only by permission of instructor.

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.
<i>Restriction(s):</i> Non MBA students only by permission of instructor.
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.
<i>Restriction(s):</i> Non MBA students only by permission of instructor.
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.
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.
<i>Restriction(s):</i> Non MBA students only by permission of instructor.
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.
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.
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.
<i>Prerequisite(s):</i> HTM*6300
<i>Restriction(s):</i> Non MBA students only by permission of instructor.
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.
<i>Restriction(s):</i> Non MBA students only by permission of instructor.
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.
<i>Restriction(s):</i> Non MBA students only by permission of instructor.
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.
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.
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.
HTM*6700 Hospitality and Tourism 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.
<i>Restriction(s):</i> Non MBA students only by permission of instructor.

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.
<i>Restriction(s):</i> Non MBA students only by permission of instructor.

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.

Integrative Biology

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*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*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*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.
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.
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 botany and zoology 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 botany and zoology 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*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.
IBIO*6100 Molecular Evolution U [0.50]
This course is designed to provide students with an appreciation for the uses of molecular data in the study of evolutionary processes. An overview of the principles of molecular data analysis using a phylogenetic approach will be given. In addition, the importance of incorporating evolutionary history into biodiversity research and other applied topics will be emphasized. Laboratory sessions will be devoted to practical training in analytical tools using specialized computer software, and for student presentation of independent research projects. The course will involve practical training in molecular data analysis using a phylogenetic approach and discussion of current topics from the primary literature

IBIO*6630 Scientific Communication I U [0.75]
The development and refinement of the skills of scientific communication, emphasizing writing skills, in the context of developing a thesis proposal.

IBIO*6640 Scientific Communication II U [0.25]
The development and refinement of the skills of scientific communication, emphasizing oral skills, and culminating in the defence of the thesis proposal.

International Development Studies

IDEV*6000 Regional Context U [0.50]
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.

IDEV*6100 International Development Studies Seminar U [0.50]
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.

IDEV*6500 Fieldwork in International Development Studies U [0.50]
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

Landscape Architecture

LARC*6010 Landscape Architecture Studio I F [0.50]
Integrated field and studio instruction introduces the student to landscape architecture through acquisition of basic skills and knowledge. Topics include history, site surveying, landscape inventory and analysis, site design, graphic communication, introductory design, sculpture, and model building.

LARC*6020 Landscape Architecture Studio II F [0.50]
Integrated field and studio instruction, and case studies leads the student through advanced site design, basic materials and techniques, design theory, and design principles.
Prerequisite(s): Students are required to satisfy a woody plants requirement either through the course HORT*3260 or equivalent.

LARC*6030 Landscape Architecture Studio III W [0.50]
Integrated field and studio instruction emphasizes design concept formulation, visual communication, computer application in design, and introductions to urban and rural greenways design, community design, facilitation, and presentation.

LARC*6040 Landscape Architecture Studio IV W [0.50]
Integrated field and studio instruction emphasizes design implementation, materials, construction, specifications, and professional practice.

LARC*6120 Advanced Design W [0.50]
Theory, methods and practice in site planning and design, human settlement, and planting design. Projects typically address open space design, conservation and community design at the small and intermediate scale in urban, suburban or rural settings. Case study component will include some travel at the student's expense.

LARC*6370 Graduate Seminar F,W [0.25]
A seminar course emphasizing the development of oral and writing skills.

LARC*6380 Research Seminar W [0.25]
A capstone course whose content is directed by the research of the participants. Participants will organize a conference at which they will present their research results.

LARC*6430 Landscape Resource Analysis F [0.50]
Integrated field and classroom instruction introduces the student to inventory and analysis of biological, physical, social and cultural elements of the landscape. Projects will incorporate principles of landscape ecology and landscape planning. Field study will require some travel at student's expense.

LARC*6440 Plants and Environment F [0.50]
This course integrates field and classroom study to apply landscape ecology to current landscape problems, including analysis of regional landscapes, restoration of degraded landscapes, and application of aesthetic and ecological principles across scales in site to regional settings. Case studies component will require some travel at students' expense.

LARC*6470 Integrative Environmental Planning W [0.50]
Landscape planning emphasizing the integration and interrelationships between biophysical and cultural resources, with application at a regional landscape planning scale. This course typically incorporates community-outreach projects and develops student facilitation abilities.

LARC*6600 Critical Inquiry & Research Analysis W [0.50]
Students are introduced to critical inquiry as a method of evaluating information, design, and planning. The focus of the course is on the quantification and analysis of research data. Modelling and simulation are introduced and discussed in the context of planning, design, and research.

LARC*6610 Research Methods F [0.50]
An introduction to a broad array of research methods as they apply to landscape planning and design. The focus of the course is on the connections between research and design and is context-based learning. The emphasis is on developing foundations for the creation of appropriate research questions.

LARC*6710 Special Study S,F,W [0.50]
Independent study. A proposal for the content and product required for this course must be developed in conjunction with the student's Advisory Committee.

Leadership Studies

LEAD*6000 Foundations of Leadership S [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.

LEAD*6100 Theories of Leadership F [0.50]
This course traces the development of the concept of leadership. Through the interplay of theory and practical application, participants will gain a deeper appreciation for the requirements, responsibilities, and consequences of effective leadership.

LEAD*6200 Leadership of Organizational Change F [0.50]
This course studies the role of leadership in the management of change within an organization and the changes required of management. The course examines the development of trust, the building of organizational loyalty, and motivation and inspiring of high performance teams.

LEAD*6300 Role of the Leader in Decision-Making W [0.50]
The role of the leader in decision-making is explored through the study of the rational model for decision-making, human biases, creativity, and risk and uncertainty in decision-making. The course will also examine ethical issues and group decision-making.

LEAD*6400 Research Methods for Decision-Making W [0.50]
The course will explore both quantitative and qualitative techniques used in the analysis of research results from a variety of sources (surveys, government statistics, in-depth interview, focus groups and program evaluation results). Case studies will be used to demonstrate the application of multiple research methods.

LEAD*6500 Ethics in Leadership F [0.50]
Issues in the use and application of ethical standards by leaders are explored through examples from history, current events, novels, films and television. Relevant theory is applied to leadership examples to help students develop an ethical framework for the exercise of leadership skills.

LEAD*6720 Politics of Organizations F [0.50]
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.

LEAD*6800 Personal Skill Self-Assessment S [0.50]
Using the "Basis of Competence" model, this course examines personal skills in four areas: Managing Self, Communicating, Managing People and Tasks, and Mobilizing Innovation and Change. The skills required to make smooth transitions from one job to another in a dynamic workplace will be explored.

LEAD*6900 Major Research Project W-S [1.00]
This course involves a directed research project leading to a referenced, professional report on a leadership problem or issue. Completion of this course will require formal presentation on the research, analysis, evaluation and recommendations to faculty and students.

Land Resource Science

LRS*6000 Physical Environment of Crops and Forests F [0.50]
Recent literature on temperature, humidity, radiation, wind, gases and particles in crop and forest environments; evapotranspiration and photosynthesis of plant communities; modification of microclimates; applied micrometeorology. Offered in even-numbered years.

LRS*6040 Micrometeorology W [0.50]
Exchanges of mass, momentum and energy between the surface and the atmosphere will be studied in the context of larger-scale meteorology. Diffusion and turbulence in and above plant canopies will be examined from theoretical and practical perspectives. Topics include time-series analysis, micrometeorological measurement theory, and basic principles of atmospheric science. Offered in even-numbered years.
LRS*6060 Agrometeorological Instrumentation W [0.50]
Theoretical and practical aspects of electronic circuits, sensors, and equipment used in agrometeorological research. Offered in odd-numbered years.
LRS*6241 Special Topics in Atmospheric Science F,U [0.25]
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.
LRS*6242 Special Topics in Atmospheric Science F,U [0.50]
See LRS*6241 above.
LRS*6250 Soil Genesis and Classification F [0.50]
A discussion of world soil regions for students not specializing in soil genesis.
LRS*6280 Soil Physics F [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.
LRS*6300 Applied Soil Physics F [0.50]
The application of soil physical principles to practical problems concerning soil physical quality, erosion, land reclamation and industrial-waste disposal on land <i>Prerequisite(s):</i> SOIL*3070.
LRS*6320 Non-equilibrium Thermodynamics of Porous Media W [0.50]
Transport processes in porous media such as soils, clays, and membranes are dealt with in the framework of non-equilibrium thermodynamics with emphasis on the coupling between water, solutes, heat and electric charge transport. Offered in alternate years.
LRS*6340 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.
LRS*6360 Soil and Water Chemistry F [0.50]
Thermodynamics of soil solutions; solution-solid phase equilibria; reaction kinetics; computer modelling of solute-mineral interactions.
LRS*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.
LRS*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.
LRS*6420 Soil Productivity F [0.50]
Soil physical, chemical and biological characteristics as they influence crop growth with emphasis on processes and mechanisms.
LRS*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. (alternate years)
LRS*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.
LRS*6582 Special Topics in Soil Science U [0.50]
See LRS*6581 above.
LRS*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.
LRS*6760 Advanced Remote Sensing W [0.50]
Critical review of the latest research papers on the use of remotely sensed data for temporal monitoring of the biosphere.

LRS*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.
LRS*6882 Special Topics in Land Resources Management U [0.50]
See LRS*6881 above.
LRS*6900 Research Issues I F [0.25]
Principles and philosophy of scientific research including the development of superior communication skills.
LRS*6910 Research Issues II W [0.25]
A continuation of Research Issues I.
LRS*6941 Analytical Instrumentation and Techniques U [0.25]
Equipment and techniques of soil and plant analyses. Variable credit will be assigned based on the number of laboratory units covered.
LRS*6942 Analytical Instrumentation and Techniques U [0.50]
See LRS*6941 above.

Literature and Theatre Studies

LTS*7770 Language Requirement U [0.00]
A written demonstration of a student's reading knowledge of one language other than English, as approved by the Joint PhD Program Committee.
LTS*7800 General Area Seminar U [0.50]
A directed-reading course to provide concentrated training in an area of research other than the student's expected area of research concentration. This seminar emphasizes thorough general knowledge of a chosen area's scope, theoretical frameworks, and research methodologies. The course is normally taken during the first year of a student's program.
LTS*7820 Intensive Area Seminar U [1.00]
A reading course intended to provide concentrated training in the student's expected area of research concentration. This seminar involves individualized, directed study of the immediate literary, cultural, and theoretical contexts of the student's approved dissertation subject. The course is normally taken in the second year of a student's PhD program.
LTS*7900 Directed Studies U [0.50]
The study of a special topic under the guidance of a member of the graduate faculty.
LTS*7990 Doctoral Dissertation U [2.00]
Submission and defense of an acceptable thesis, written by the PhD 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.

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.
MATH*6051 Mathematical Modelling U [0.50]
Selected advanced topics in mathematical modelling, possibly in conjunction with the departmental Mathematics and Statistics Clinic.
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*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]

Molecular Biology and Genetics

MBG*6000 Seminars in Molecular Biology and Genetics F,W [0.00]
A forum for topical discussions in molecular biology and genetics. Students in the MSc and PhD programs in molecular biology and genetics are required to register in this course for four and six semesters, respectively.
MCB*6010 Advanced Topics in Biochemistry U [0.50]
This course provides opportunities for graduate students to study special topics in contemporary biochemical research under the guidance of graduate faculty members with pertinent expertise. Proposed course descriptions are considered by the Department of Molecular and Cellular Biology on an ad hoc basis, and the course will be offered according to demand.
MBG*6020 Topics in Molecular Biology and Biotechnology W [0.50]
The course will review recent publications in molecular genetics and developmental biology, and provide opportunity for discussion of how recombinant DNA technology is being used in basic research and in biotechnology. This course is offered yearly.
MBG*6050 Recombinant DNA Technology S [0.50]
A laboratory course including DNA and vector purification, preparation of genomic libraries and subcloning using plasmid vectors, PCR, and Southern blotting. Please contact the department for detailed information.
MBG*6060 Topics in Cell Biology and Genetics F [0.50]
The course will review recent publications in transmission genetics, chromosome structure and recombination, and provide opportunity for discussion of cell biology topics where advances in genetics are having an impact. This course is offered yearly.
MBG*6080 Research Topics Course F,W,S [0.50]
This course will require that students research and write a proposal for the work they plan to pursue for their thesis topic. It must be taken within the first two semesters of a graduate program, and will be under the supervision of the student's advisory committee. Students will present a seminar on this literature review and proposal as part of their participation in this course.
MBG*6100 High Resolution Microscopy for Molecular Biologists W [0.50]
A laboratory course to acquaint students with high resolution light and electron microscopy technology common to molecular biologists and geneticists. The course includes hybridization and immunological probing techniques being applied to the cellular apparatus for gene expression as well as technology used with purified DNA and nucleoprotein complexes. This course is offered yearly.

MCB*6110 Protein Structural Biology and Bioinformatics W [0.50]
This course will explore the relationship between protein sequences and structure. Students will gain hands-on experience with web-based resources and tools, particularly methods relating to protein structural prediction.
MCB*6210 Structure and Function of Biological Membranes F [0.50]
This course covers multidisciplinary investigations of the basic structure of membranes, and their role in eukaryotic and prokaryotic cell biology. Topics will include structural biology of membrane proteins, experimental approaches for studying membranes, membrane transport systems, import-export systems and membrane trafficking.
Microbiology
MICR*6040 Advanced Microbial Physiology W [0.50]
A study of molecular structure-function relationships fundamental to the survival and growth of bacteria. Topics for study will be selected from the literature on bacterial cytology, bioenergetics, metabolism, enzymology and adaptation.
MICR*6070 Bacterial Structures and Virulence F [0.50]
A study of the roles of bacterial surface structures (LPS, capsules, flagella, fimbriae, outer membrane proteins) in the virulence of bacteria. (Jointly offered by the Departments of Microbiology and Pathobiology.)
MICR*6130 Molecular Biology of Viruses W [0.50]
Replication strategies of virus genomes including prototypes of different animal, plant and (some) bacterial virus families; mechanism and control of viral gene expression; tumour virology; genetically engineered virus vaccines <i>Restriction(s):</i> Credit can NOT be obtained for both MICR*4130 and MICR*6130.
MICR*6423 Advances in Immunology and Immunochemical Techniques W [0.50]
Concepts and current knowledge of the diversity of immune response, experimental systems used in studying immunology, antigen-antibody reaction methods, monoclonal antibodies, antibody engineering, hypersensitivity reactions, autoimmunity, adhesion molecules and homing of cells of the immune system.
MICR*6500 Microbial Genetics W [0.50]
A study of recent research developments on the mechanisms of regulation of gene expression, DNA metabolism and genome analysis of microorganisms. (Offered in even-numbered years.)
MICR*6540 Introductory Seminar F,W,S [0.25]
A literature review of a selected area of microbiological research concluding with a written research proposal, and a seminar on the information which is presented within the first two semesters of the program. The course is required for MSc students, but is optional for PhD students who have taken an equivalent course.
MICR*6590 Advanced Seminar F,W [0.25]
Public seminars on current microbiological or allied research topics. MSc students give one seminar while Ph.D. students give two seminars. The topics must be on subjects other than the student's area of research.
MICR*6950 Selected Topics in Microbiology U [0.50]
This course, offered on an irregular basis, provides opportunities for graduate students to study special topics of mutual interest under the guidance of graduate faculty members with pertinent expertise. Proposed course descriptions are considered by the Department of Microbiology on an ad hoc basis.
Pathobiology
PABI*6000 Bacterial Pathogenesis F [0.50]
Pathogenic bacteria with particular reference to pathogenesis, immunology, epidemiology and control.
PABI*6030 Applied Clinical Pathology I F,W,S [0.50]
Preparation and description of materials, and interpretation of data involved in hematology, cytology, and clinical chemistry from clinical cases. (Intended for students majoring in clinical pathology.)
PABI*6040 Applied Clinical Pathology II U [0.50]
A continuation of PABI*6030 with greater depth in the interpretation of data involved in hematology, cytology and clinical chemistry from clinical cases (Intended for students majoring in clinical pathology.)
PABI*6041 Applied Clinical Pathology III U [0.50]
A continuation of PABI*6040 with greater depth in the interpretation of data involved in hematology, cytology and clinical chemistry from clinical cases (Intended for students majoring in clinical pathology.)

PABI*6050 Applied Avian Pathology I F [0.50]
Examination and interpretation of gross and microscopic lesions of domestic birds.
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 and early spring conditions.
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 late spring and summer conditions.
PABI*6080 Diagnostic Pathology I - Domestic Mammals F [0.50]
Examination and interpretation of gross and microscopic lesions of animal diseases.
PABI*6090 Diagnostic Pathology II - Domestic Mammals W [0.50]
A continuation of PABI*6080, emphasizing seasonal differences in diseases as well as diseases more commonly associated with winter and early spring conditions.
PABI*6091 Diagnostic Pathology III - Domestic Mammals S [0.50]
A continuation of PABI*6090, emphasizing seasonal differences in diseases as well as diseases more commonly associated with late spring and summer conditions.
PABI*6100 Immunobiology F [0.50]
Major areas of immunology, including initiation, regulation, receptors, genetics, immune system development and function.
PABI*6104 Mechanisms of Disease F [0.50]
Molecular, cellular and tissue processes involved in the pathogenesis of adaptive, degenerative, inflammatory, proliferative and neoplastic diseases. (odd numbered years)
PABI*6105 Integrative Pathology F [0.50]
Basic and interpretive tissue and biochemical concepts of disease in the liver, pancreas, kidney, endocrine and hemicymphatic systems. (even numbered years)
PABI*6110 Pathology I W [0.50]
Disease processes of the respiratory, integumentary, reproductive and skeletal systems. (Disease processes of the respiratory, integumentary, reproductive and skeletal systems.)
PABI*6130 Pathology II W [0.50]
Disease processes of the alimentary, central-nervous, cardiovascular and muscular systems and special senses. (odd numbered years)
PABI*6180 Clinical Bacteriology W [0.50]
Current techniques and approaches in diagnostic bacteriology.
PABI*6190 Topics in Immunology W [0.50]
Aspects of immune and non-specific host resistance, diagnostic immunology and immune-mediated disease.
PABI*6221 Comparative Veterinary Pathology I W [0.50]
Pathological changes associated with diseases of fish, amphibia, reptiles, wild and captive non-domestic birds, marine and wild mammals including fur-bearers. (even numbered years)
PABI*6222 Comparative Veterinary Pathology II F [0.50]
Pathological changes associated with diseases of poultry and pet birds, and various laboratory animals. (even numbered years)
PABI*6300 Clinical Pathology I W [0.50]
A study of diagnostic hematology and cytology, with emphasis on the hematopoietic system. (even numbered years)
PABI*6320 Clinical Pathology II W [0.50]
Clinical biochemistry of selected organ systems including the renal, hepatic, pancreatic and endocrine organ systems. (odd numbered years)
PABI*6330 Viral Diseases F [0.50]
A study of important viral diseases of animals, with emphasis on etiology, host responses, diagnosis and control.
PABI*6350 Molecular Epidemiology of Bacterial Diseases U [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.
<i>Prerequisite(s):</i> STAT*2040 Statistics I
<i>Restriction(s):</i> Lab component: limited number of participants and WHIMIS certificate compulsory.

PABI*6400 Seminar F,W,S [0.00]
A thesis research plan to be presented orally to the department by the third week of the third semester.
PABI*6420 Diagnostic Parasitology F [0.50]
Study of the laboratory diagnosis of parasites of domestic animals. (even numbered years)
PABI*6630 Applied Comparative Pathology I F [0.50]
A study of problems in, as well as the examination of, lesions found in diseases of fish and wildlife, including amphibia and reptiles, drawn from naturally occurring cases assigned for detailed investigation. The student may be required to prepare a critical review of a specific disease entity.
PABI*6640 Applied Comparative Pathology II W [0.50]
A continuation of PABI*6630 emphasizing seasonal differences in diseases as well as diseases more commonly associated with winter and early spring conditions.
PABI*6650 Applied Comparative Pathology III F [0.50]
A continuation of PABI*6640 emphasizing seasonal difference in diseases as well as diseases more commonly associated with late spring and summer conditions.
PABI*6700 Laboratory Animal Science U [0.50]
Basic information on various aspects of laboratory animal science, including IACUC function, regulatory oversight, ethics, historical review of animal research, animal models and alternatives, experimental design and considerations, biology, management and uses of common species in research.
PABI*6710 Applied Laboratory Animal Science I U [0.50]
Continuation of I with emphasis on biohazard and personnel safety, monitoring for disease, quality control and diagnostic procedures.
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.
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.
PABI*6740 Avian Diseases W [0.50]
Detailed study of recent concepts of preventive medicine, diagnosis and therapeutics as applied to clinical recognition and control of avian diseases.
PABI*6960 Special Topics in Pathobiology F,W,S [0.00]
In-depth independent study of subjects related to students' principal area of interest. Major paper(s), laboratory studies, and/or written and oral examination, with or without seminar preparation.

Philosophy

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 Continental Theory 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 Continental Theory 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 of problems in biomedical ethics.
PHIL*6310 Plato U [0.50]
A study of some of the major works of Plato.
PHIL*6311 Aristotle U [0.50]
A study of some of the major works of Aristotle.
PHIL*6320 Medieval Philosophy U [0.50]
A close examination of particular problems and texts of the medieval period
PHIL*6340 Modern Philosophy U [0.50]
An examination of major texts, from Descartes to Mill.
PHIL*6500 John Locke U [0.50]
A critical examination of the works of John Locke.
PHIL*6530 Kant U [0.50]
A critical examination of the works of Immanuel Kant.
PHIL*6600 Social and Political Philosophy U [0.50]
A critical examination of some selected contemporary works or central problems in the field of social philosophy.
PHIL*6700 Survey of Ancient Philosophy U [0.50]
A survey of modern philosophy from Hobbes to Hume for students in the philosophy MA program without a BA in philosophy.
PHIL*6710 Survey of Early Modern Philosophy U [0.50]
A survey of modern philosophy from Hobbes to Hume for students in the philosophy MA program without a BA in philosophy.
PHIL*6720 History of the Philosophy of Science U [0.50]
A survey of the history of the philosophy of science from the Presocratics to the Positivists.
PHIL*6730 Contemporary Philosophy of Science U [0.50]
An examination of the contemporary discipline of the philosophy of science.
PHIL*6740 Philosophy of Biology U [0.50]
A general introduction to the history and philosophy of biology.
PHIL*6750 Philosophy of Social Science U [0.50]
A critical examination of issues in the philosophy of social science
PHIL*6760 Science and Ethics U [0.50]
A consideration of the problems which arise in the conjunction of science and ethics.
PHIL*6770 Special Research Paper I U [0.50]
A research course in a topic of the student's choice, guided by an individual faculty member.
PHIL*6780 Special Research Paper II U [0.50]
A research course in a topic of the student's choice, guided by an individual faculty member.
PHIL*6810 Survey of Late Modern Philosophy U [0.50]
A survey of modern philosophy from Kant to the late 19th century for students in the MA program without a BA in philosophy.
PHIL*6900 Reading Course U [0.50]
PHIL*6930 Selected Topics I U [0.50]
Topics in this course will vary from offering to offering.
PHIL*6940 Selected Topics II U [0.50]
Topics in this course will vary from offering to offering.
PHIL*6950 MA Seminar U [0.50]
A seminar course in which students work on developing research papers in topics of their own choice. This course must be taken by all MA students. Students must register for this course in both fall and winter semesters.

PHIL*6960 PhD Graduate Seminar U [0.50]
A seminar course in which students work on developing research papers in topics of their own choice. Students must register for this course in both fall and winter semesters. PhD students must do at least one and may do two graduate seminar courses during their programs.
PHIL*6990 Guided Research Project U [1.00]
A guided research project undertaken by students doing an MA by course work, under the supervision of a faculty member.

Physics

PHYS*7010 Quantum Mechanics I * U [0.50]
Review of formalism of nonrelativistic quantum mechanics including symmetries and invariance. Approximation methods and scattering theory. Elementary quantum theory of radiation. Introduction to one-particle relativistic wave equations.
PHYS*7020 Quantum Mechanics II U [0.50]
Concepts of relativistic quantum mechanics, elementary quantum field theory, and Feynman diagrams. Application to many-particle systems. <i>Prerequisite(s):</i> 7010 or equivalent
PHYS*7030 Quantum Field Theory U [0.50]
Review of relativistic quantum mechanics and classical field theory. Quantization of free quantum fields (the particle interpretation of field quanta). Canonical quantization of interacting fields (Feynman rules). Application of the formalism of interacting quantum fields to lowest-order quantum electrodynamic processes. Radiative corrections and renormalization. <i>Prerequisite(s):</i> PHYS*7010 or equivalent.
PHYS*7040 Statistical Physics I * U [0.50]
Statistical basis of thermodynamics; microcanonical, canonical and grand canonical ensembles; quantum statistical mechanics, theory of the density matrix; fluctuations, noise, irreversible thermodynamics; transport theory; application to gases, liquids, solids.
PHYS*7050 Statistical Physics II U [0.50]
Phase transitions. Fluctuation phenomena. Kubo's theory of time correlation functions for transport and spectral properties; applications selected from a variety of topics including linearized hydrodynamics of normal and superfluids, molecular liquids, liquid crystals, surface phenomena, theory of the dielectric constant, etc. <i>Prerequisite(s):</i> PHYS*7040 or equivalent.
PHYS*7060 Electromagnetic Theory * U [0.50]
Solutions to Maxwell's equations; radiation theory, normal modes; multipole expansion; Kirchhoff's diffraction theory; radiating point charge; optical theorem. Special relativity; transformation laws for the electromagnetic field; line broadening. Dispersion; Kramers-Kronig relations. Magnetohydrodynamics and plasmas.
PHYS*7080 Applications of Group Theory U [0.50]
Introduction to group theory; symmetry, the group concept, representation theory, character theory. Applications to molecular vibrations, the solid state, quantum mechanics and crystal field theory.
PHYS*7090 Green's Function Method U [0.50]
Review of essential quantum field theory. Zero and finite temperature. Green's functions. Applications.
PHYS*7100 Atomic Physics U [0.50]
Emphasis on atomic structure and spectroscopy. Review of angular momentum, rotations, Wigner-Eckart theorem, n-j symbols. Energy levels in complex atoms, Hartree-Fock theory, radiative-transitions and inner-shell processes. Further topics selected with class interest in mind, at least one of which is to be taken from current literature.
PHYS*7110 Scattering Theory U [0.50]
Review of potential theory of scattering. Applications chosen from elastic- and inelastic-neutron X-ray, light, charged-particle, and atomic and molecular beam scattering.
PHYS*7120 Selected Topics in Theoretical Physics U [0.50]
PHYS*7130 Molecular Physics U [0.50]
Angular momentum and the rotation of molecules; introduction to group theory with application to molecular vibrations; principles of molecular spectroscopy; spectra of isolated molecules; intermolecular interactions and their effects on molecular spectra; selected additional topics (e.g., electronic structure of molecules, experimental spectroscopic techniques, neutron scattering, correlation functions, collision induced absorption, extension of group theory to molecular crystals, normal co-ordinate analysis, etc.).

PHYS*7150 Nuclear Physics U [0.50]
Static properties of nuclei; alpha, beta, gamma decay; two-body systems; nuclear forces; nuclear reactions; single-particle models for spherical and deformed nuclei; shell, collective, interacting boson models.
PHYS*7170 Intermediate and High Energy Physics U [0.50]
Strong, electromagnetic and weak interactions. Isospin, strangeness, conservation laws and symmetry principles. Leptons, hadrons, quarks and their classification, formation, interactions and decay.
PHYS*7200 Liquid State Physics U [0.50]
Physical properties of atomic liquids; distribution functions and equilibrium properties, elementary perturbation theories and integral equation theories; simple metals, simple computer simulation; viral expansions and thermodynamic derivatives of $g(r)$; experimental determination of $g(r)$.
PHYS*7310 Solid State Physics I U [0.50]
Phonons, electron states, electron-electron interaction, electron-ion interaction, static properties of solids.
PHYS*7320 Solid State Physics II U [0.50]
Transport properties; optical properties; magnetism; superconductivity; disordered systems.
PHYS*7330 Selected Topics in Theoretical Condensed Matter Physics U [0.50]
PHYS*7350 Photoconductivity and Luminescence U [0.50]
Electron processes in crystals, photoconductive processes. Electrode effects, imperfection and energy band transitions, scattering traps and trapping effects. Recombination kinetics, luminescence. Experimental methods and analysis.
PHYS*7360 Optical Properties of Semiconductors U [0.50]
Reflection and refraction of electromagnetic waves at dielectric and conducting interfaces. Dispersion, absorption processes, photo effects, magneto-optical effects, emission of radiation.
PHYS*7410 Electron Microscopy and Electron Diffraction U [0.50]
Introduction to electron optics and the electron microscope; kinematical and dynamical theories of electron diffraction by perfect crystals and by crystals containing lattice imperfections, limited-area electron diffraction, dark-field microscopy, interpretation of electron-diffraction patterns and diffraction-contrast effects in electron-microscope images, selected experimental methods in electron microscopy.
PHYS*7420 Basic Theory of Nuclear Magnetic Resonance * U [0.50]
Quantum mechanics of spins in magnetic field; Bloch equations; NMR apparatus; the various nuclear-spin interactions; spin temperature; density matrix; spin-lattice relaxation; double resonance.
PHYS*7450 Selected 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*7460 Nonlinear Optics U [0.50]
Classical and Quantum Mechanical descriptions of nonlinear susceptibility, nonlinear wave propagation, nonlinear effects such as Pockel's and Kerr effects, harmonic generation, phase conjugation and stimulated scattering processes.
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.
PHYS*7480 Microprocessors in the Physics Laboratory U [0.50]
Interfacing and programming of microprocessors for applications in physics, including signal averaging, auto- and cross-correlation analysis, multichannel spectrum analysis, and Fourier transformation. Consideration of hardware versus software methods for optimization of speed and system size.
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*7530 Radiation Biophysics U [0.50]
Physical properties and biological effects of different kinds of radiation: action of radiation on various cellular constituents: target theory, genetic effects, repair of radiation damage, physics of radiology and radiotherapy, isotopic tracers.
PHYS*7540 Selected Topics in Experimental Biophysics U [0.50]
Offered on demand
PHYS*7550 Biophysics of Organ Systems U [0.50]
Specialized cells and organs; the nerve impulse and its propagation, muscle contraction, sensory transducers, the central nervous system; haemodynamics, the red-blood corpuscle, homeostasis; selected topics of current interest, and seminar.
PHYS*7570 Special Topics in Biophysics U [0.50]
Offered on demand
PHYS*7650 Quantum Theory of Solid Surfaces U [0.50]
Brief historical review. Molecular orbital approach to surface and chemisorption states. Use of Kronig-Penny, Mathieu potential and Nearly-Free-Electron models. Crystal composition, next-nearest-neighbour interactions, sp- hybridization and applied-field effects on surface states will be discussed.
PHYS*7670 Introduction to Quantum Information Processing F [0.50]
Quantum superposition, interference, and entanglement. Postulates of Quantum Mechanics. Quantum computational complexity. Quantum Algorithms. Quantum communication and cryptography. Quantum error correction. Implementations.
PHYS*7710 Special Lecture and Reading Course U [0.50]
PHYS*7720 Selected Seminar and Module Course (for inter-departmental students) U [0.50]
PHYS*7730 Special Topics in Physics U [0.50]
PHYS*7750 Interinstitution Exchange U [0.50]
At the director's discretion, a PhD student may receive course credit for a term of specialized studies at another institution. Formal evaluation is required.
PHYS*7800 Galactic Structure U [0.50]
Introduction to statistical theory and distribution laws. Statistical theory of the galactic system. Stellar motions in the solar vicinity. Galactic rotation. Space distribution of stars and their relation to the galaxy. Distribution of various galactic objects. Application to extra-galactic systems.
PHYS*7810 Astrophysics U [0.50]
The fundamental astronomical data: techniques to obtain it and the shortcomings present. The classification systems. Wide- and narrow-band photometric systems. The intrinsic properties of stars: colours, luminosities, masses, radii, temperatures. Variable stars. Distance indicators. Interstellar reddening. Related topics.
PHYS*7840 Advanced General Relativity W [0.50]
Review of elementary general relativity. Timelike and null geodesic congruences. Hypersurfaces and junction conditions. Lagrangian and Hamiltonian formulations of general relativity. Mass and angular momentum of a gravitating body. The laws of black-hole mechanics.
PHYS*7850 Quantum Field Theory for Cosmology U [0.50]
Introduction to scalar field theory and its canonical quantization in flat and curved spacetimes. The flat space effects of Casimir and Unruh. Quantum fluctuations of scalar fields and of the metric on curved space-times and application to inflationary cosmology. Hawking radiation. <i>Prerequisite(s):</i> PHYS*7010
PHYS*7860 General Relativity for Cosmology U [0.50]
Introduction to the differential geometry of Lorentzian manifolds. The principles of general relativity. Causal structure and cosmological singularities. Cosmological space-times with Killing vector fields. Friedmann-Lemaître cosmologies, scalar vector and tensor perturbations in the linear and nonlinear regimes. De Sitter space-times and inflationary models.
PHYS*7870 Cosmology U [0.50]
Friedmann-Robertson-Walker metric and dynamics; big bang thermodynamics; nucleosynthesis; recombination; perturbation theory and structure formation; anisotropies in the Cosmic Microwave Background; statistics of cosmological density and velocity fields; galaxy formation; inflation.
PHYS*7880 Selected Topics in Astronomy U [0.50]
Offered on demand

PHYS*7890 Selected Topics in Astrophysics U [0.50]
Offered on demand
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
PHYS*8900 Interuniversity Graduate Course in Biophysics U [0.50]
This graduate course is offered using the combined biophysical resources of the Universities of Brock, Guelph, McMaster and Waterloo. Three topics constitute the equivalent of a one-semester 3 hr./week graduate course. Information about the course and the selection of individual topics can be obtained from the departmental course co-ordinator. Registration and credit will occur in the semester of the last module.

Plant Agriculture

PLNT*6010 Physiology of Crop Yield W [0.50]
Physiological and environmental principles as they relate to the growth of crop plants and communities. Plant and environmental characteristics determining transpiration, photosynthesis, leaf growth and reproductive growth and development. Simulation of plant growth. <i>External Course Code(s):</i> Offered in even years.
PLNT*6020 Issues in Food Safety Risk Analysis S [0.50]
This course is based on the principles of risk analysis - assessment, management and communication - their application to food safety, agricultural biotechnology and food policy development
PLNT*6030 Food Safety Policy W [0.50]
This course will examine the interplay between science, risk, economics and politics that lead to food safety policy development. Students will be introduced to national and international approaches to food safety policy, as well as in-depth case studies. Lectures, readings and resource material will focus on real-life development of food safety policy, drawing on the experience of a number of distinguished lecturers who have participated in a broad range of food safety policy developments.
PLNT*6050 Principles and Application of Plant Tissue Culture F [0.50]
The course involves lecture and discussions of fundamental and applied aspects of plant tissue culture. Topics will include the role of tissue culture in understanding plant development, physiology and genetics, and its commercial applications in horticulture and forestry. <i>External Course Code(s):</i> Offered in odd years.
PLNT*6100 Advanced Crop Breeding F [0.25]
The practical application of genetic theory and biological limitations to improving plant populations as germplasm and for cultivar development will be presented and discussed. Sources of variation, selection methods, genotype evaluation and cultivar multiplication will be addressed in lectures and discussions.
PLNT*6110 Postharvest Physiology W [0.50]
Discussion of the physiological effects of controlled and supplemental environments or treatments on horticultural crops. Emphasis is on current problems and research. <i>External Course Code(s):</i> Offered in odd years.
PLNT*6120 Protein and Oilseed Crop Breeding F [0.25]
This course will address both theoretical and practical aspects of protein and oilseed crop breeding. Current and emerging breeding methodologies to achieve major agronomic and compositional goals will be examined from the perspective of theoretical, technical and financial efficiencies.
PLNT*6130 Corn Breeding W [0.25]
Principles of corn breeding with emphasis on germplasm enhancement and methods of improving breeding populations as sources of inbred lines for hybrid programs and for direct use as improved varieties
PLNT*6150 Plant Breeding -The Profession W [0.25]
The course will address professional aspects of plant breeding including: legal/regulatory issues, ethical issues related to germplasm, and rights and responsibilities related to intellectual property under UPOV and World Patent Organization conventions.
PLNT*6160 Quantitative Genetic Variation in Crop Populations F [0.25]
Fundamentals of quantitative genetics. Topics will include gene and genotype frequencies, forces affecting equilibrium, small population size, inbreeding, means, variances, covariances and resemblance among relatives. Lecture topics will be expanded through discussion of classic and current papers.

PLNT*6170 Statistics in Plant Agriculture W [0.50]
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.
PLNT*6220 Advanced Studies in Pomology W [0.50]
Discussion of current problems and research on fruit crop production and physiology. <i>External Course Code(s):</i> Offered in even years
PLNT*6230 Colloquium in Crop Physiology and Management F,W [0.25]
An open discussion and/or workshop course designed to review and critically analyze contemporary issues in crop physiology and management. The fall course is generally devoted to computer simulation of crop growth and development.
PLNT*6240 Colloquium on Weed Management in Agrosystems W [0.25]
An open discussion course designed to review and critically analyze contemporary issues in plant ecology and their relevance to practical weed management systems.
PLNT*6250 Colloquium in Genetics, Biotechnology and Plant Breeding F,W [0.25]
An open discussion course designed to review and critically analyze contemporary issues in plant genetics, biotechnology and breeding.
PLNT*6260 Advanced Crop Genetics W [0.50]
A lecture and discussion course on some of the recent advances in genetics as they pertain to crop improvement. Topics will include: the molecular basis of selected agronomic traits, molecular marker assisted selection, isolation of plant genes and plant transformation systems.
PLNT*6290 Physiological Genetics of Higher Plants F [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. <i>External Course Code(s):</i> Offered in odd years.
PLNT*6400 Seminar F,W [0.25]
All graduate students present a departmental seminar on their research proposal no later than the second semester. PhD students present an additional seminar on their thesis research before the end of the sixth semester (or the equivalent). Each student is expected to participate in the seminars of colleagues and faculty.
PLNT*6410 Advanced Seminar F-W [0.25]
PhD students present a seminar on their research to date before the end of the sixth semester (or the equivalent). Each student is expected to participate in the seminars of colleagues and faculty. <i>Prerequisite(s):</i> PLNT*6400
PLNT*6490 Colloquium in Physiology of Ornamental Crops F [0.50]
Current topics in the area of floriculture, turfgrass, and woody plant physiology. <i>External Course Code(s):</i> Offered in even years.
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 phylogenies, 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. <i>Prerequisite(s):</i> Undergraduate level statistics class (such as STAT*2040 or STAT*2100) and undergraduate level molecular biology class (such as MBG*2020).

Political Science

POLS*6210 Canadian Politics: Process and Culture U [0.50]
This course begins with a study of the works of democratic theorists, Canadian and foreign. Conclusions drawn from this analysis are then applied to our political institutions and processes with a view to their evaluation and reform in accordance with the democratic ideal.
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*6370 Latin America and the Caribbean U [0.50]
The analysis of the political development of Latin America and the Caribbean looking at the context, ideologies, structures, processes and effects of policy formulation and implementation.
POLS*6390 Environmental Policy and Law U [0.50]
Examination of the policy, institutions, processes and legal procedures which encompass the field of environmental policy-making and law in Canada.
POLS*6450 The Political Economy of Trade Policy U [0.50]
This course examines international trade policies - multilateral, bilateral and unilateral - from a political economy perspective with particular attention to the evolving World Trade Organization as well as regional experiences under NAFTA and the European Union.
POLS*6630 Public Policy and Administration: Theory and Practice U [0.50]
This course provides an overview of important contributions in the study of public policy and public administration. It reviews a number of theories of the state and the literatures which have grown up around them. It also covers a range of narrower areas of public policy and administration such as organization theory, public budgeting and regulation and the literatures which they have generated.
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*6650 Organization and Decision-Making Theory U [0.50]
This course reviews a variety of theories and models used for explaining public sector organization behaviour. The models include economics, political science, contingency and institutional approaches. The theories and models are then used to examine actual behaviour in a variety of public sector organizations.
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 Administration U [0.50]
This course traces the roots of the developmental paradigm and the emergence of a unique administrative mechanism to handle the development goals of Third World nations. Special issues for discussion include: the cultural context of development administration, sustainable development, technology transfer, corruption and administrative accountability.
POLS*6900 Pro-Seminar U [0.25]
This course is a 0.25 credit course introducing students to graduate studies in the department and to the profession of political science. It includes information on the following: formation of a student's faculty advisory committee; preparation of research proposals for thesis and major papers; library orientation; research using the WWW and computers; and discussion of faculty research. All graduate students are required to take this course. The course is graded satisfactory (SAT) or unsatisfactory (UNS).
POLS*6940 Political Research: Theories and Approaches U [0.50]
This course provides an introduction to the nature of empirical social science by examining the major theoretical approaches to the study of politics. It is designed to encourage students to understand and critically assess the potential and limitations in each. Accordingly, a comprehensive survey of the philosophical assumptions and the methodological issues underlying political inquiry and analysis are undertaken, with a focus on the fields of study in the departmental graduate program.
POLS*6950 Specialized Topics in Political Studies U [0.50]
This course is intended to be an elective course for students wishing to pursue an area of investigation not covered in the other courses offered by the department. This course may also be chosen by students who want to further pursue a subject area to which they were introduced in a previous course.
POLS*6960 Directed Readings U [0.50]
This is an elective course for students wishing to pursue an area of investigation not covered in other courses offered by the department. This course may also be chosen by students who want to further pursue a subject area to which they were introduced in a previous course.

POLS*6970 Major Paper U [1.00]
The major paper is an extensive research paper for those who do not elect to complete a thesis. It may be taken over two semesters. The length of the major paper is not to exceed 10,000 words.
Population Medicine
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*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.
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.
<i>Prerequisite(s):</i> 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.
POPM*6290 Statistics for the Health Sciences W [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.
<i>Prerequisite(s):</i> POPM*6200 or STAT*2040 or equivalent
POPM*6300 Epidemiology of Zoonoses W [0.50]
Characterization and distribution of diseases common to man and animals.
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.
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*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.

POPM*6700 Swine Health Management * U [0.50]
Diseases of swine are studied with particular emphasis on preventive medicine and herd-health management.

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.

Psychology

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*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.
Restriction(s): Restricted to Psychology graduate students; all others by permission only

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*6270 Issues in Family-Related 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*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.
Restriction(s): For Clinical Psychology: Applied Developmental Emphasis students, registration is dependent on permission of the instructor and the successful completion (passing grade and satisfactory rating on the practical component) of PSYC*6010, PSYC*6690 and PSYC*6700.

PSYC*6472 Practicum II U [1.00]
See PSYC*6471 above. Students work four to five days a week in the selected setting.

PSYC*6473 Practicum III U [0.25]
See PSYC*6471 above. This course is intended for students who wish to gain additional practicum experience after completing the requirements for PSYC*6471/2. 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*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*6590 Social and Community Intervention U [0.50]
Discussion focuses on strategies of preventing mental illness and promoting mental health and social competence. Stressful life event theory, social support, coping, and the epidemiology of mental illness are reviewed.

PSYC*6610 Advanced Child and Adolescent Psychotherapy U [0.50]
This course will consider newly emerging developments in child and adolescent psychotherapy. In addition, issues of power relationships, cultural sensitivity and empirical support will be addressed
Prerequisite(s): PSYC*6580 and PSYC*6472. PSYC*6472 may be taken concurrently with PSYC*6610.

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*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*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*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. Restricted to applied developmental students. As a prerequisite for PSYC*6471, a passing grade and a satisfactory rating on the practical component must be achieved.

PSYC*6700 Personality and Social Assessment of Children and Adolescents U [0.50]
This course considers projectives, questionnaires, observations and interviews for assessing children's personality and behaviour. Students administer tests, score, interpret and write reports under supervision. Restricted to applied developmental students. As a prerequisite for PSYC*6471, a passing grade and a satisfactory rating on the practical component must be achieved.

PSYC*6750 Applications of Cognitive Science W [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.
Restriction(s): Restricted to Psychology graduate students; all others by permission only

PSYC*6770 Modelling Mental Processes W [0.50]
This is a course in the nature of models of cognitive phenomena, with emphasis on the evaluation of computational and connectionist models for perception, memory, cognition, and action. It involves practical work: the construction and testing of models using software designed for that purpose.
Prerequisite(s): PSYC*6780

PSYC*6780 Foundations of Cognitive Science F [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. <i>Restriction(s):</i> 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 Learning and Physiology U [0.50]
This course reviews the major theories, issues, and methodologies guiding contemporary research in learning, comparative, and physiological psychology.
PSYC*6810 Neuropsychology U [0.50]
This course focuses on current developments in neuropsychology. Particular emphasis is placed on the aphasias, apraxias, memory disorders, and disorders of movement.
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. <i>Prerequisite(s):</i> PSYC*6670 Research Methods
PSYC*6870 Human Factors U [0.50]
This course provides an overview of contemporary theory and research in human factors/ergonomics. Topics may include visual performance, information processing, human error, decision-making, mental workload, process control and automation, attention and time sharing, human factors in specific occupational environments, monitoring and supervisory control.
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. <i>Co-requisite(s):</i> PSYC*6880
PSYC*6900 Philosophy and History of Psychology as a Science U [0.50]
This doctoral course examines the philosophical and metatheoretical issues involved in the scientific analysis of human experience. Both the historical context of these issues and the status of current metatheoretical debates are covered.
PSYC*7010 Personnel I: Foundations of Personnel Decisions U [0.50]
Basic personnel functions are discussed, including job analysis, job evaluation, human resource planning, and criterion development, as well as the economic and legal environment in which these activities take place.
PSYC*7020 Personnel II: Recruitment, Selection, and Placement U [0.50]
An examination of theory, research, and practice in the area of personnel selection.
PSYC*7030 Organizational Psychology I: Micro and Macro Influences U [0.50]
This course examines micro- and, to a lesser extent, macro-level influences on organizational behaviour. Topics include absenteeism, turnover, work attitudes, stress, occupational health and safety, and unionization.
PSYC*7040 Organizational Psychology II: Group and Intergroup Processes U [0.50]
This course examines theories, research, and application of group and intergroup processes within the organizational context. Topics include basic group dynamics, leadership and supervision, conflict, and industrial relations as well as gender, minority, and cross-cultural issues.

PSYC*7060 Organization Development Consulting U [0.50]
An introduction to the theories and consultation techniques for improving organizational effectiveness.
PSYC*7070 Psychological Measurement U [0.50]
Concepts and applications of classical measurement theory, especially reliability and validity of tests and measurements used in applied psychology. Principles of test construction, standardization, norming, administration, and interpretation are discussed, as well as integration of test information and its use in decision making. <i>Restriction(s):</i> Instructor's signature required
PSYC*7080 Organizational Interventions U [0.50]
This course examines various modes of organizational intervention from the standpoint of both theory and practice. Areas typically covered include training and development, organizational development and change, individual coaching, and consulting skills development. <i>Prerequisite(s):</i> Registration in the graduate IO psychology program and permission of the Instructor.
PSYC*7130 Industrial/Organizational Psychology Doctoral Research Seminar I U [0.50]
This course introduces participants to a broad range of research in Industrial/Organizational psychology. It emphasizes critical examination and discussion to develop skills in theory building and programmatic research. This course is intended to prepare participants for the Industrial/Organizational Doctoral Research Seminar II and Research Internship(s).
PSYC*7140 Industrial/Organizational Psychology Doctoral Research Seminar II U [0.50]
Participants investigate a specific area of Industrial/Organizational psychology. They critically review past and current research, including theory development and empirical findings. Participants work together to integrate past theory and findings, to note inconsistencies in the literature, and to identify promising areas for future investigations. <i>Prerequisite(s):</i> PSYC*7130.
PSYC*7160 Applications of Industrial/Organizational Psychology U [0.25]
This half course provides the opportunity for the integration of material covered throughout the graduate program. Students will design specific interventions that integrate technical, organizational, and ethical issues in response to various organizational problems.
PSYC*7170 Industrial/Organizational Psychology Doctoral Research Internship I U [0.50]
Participants work with an Industrial Organizational faculty member to conduct research on a topic of mutual interest (other than their doctoral research). They collect and/or analyze data and write up results with the goal of producing a conference presentation and/or a quality publication manuscript. <i>Prerequisite(s):</i> PSYC*7130 <i>Co-requisite(s):</i> PSYC*7140 <i>Restriction(s):</i> Instructor's signature required
PSYC*7180 Industrial/Organizational Psychology Doctoral Research Internship II U [0.50]
Participants work with an Industrial Organizational faculty member to conduct research on a topic of mutual interest (other than their doctoral research). They collect and/or analyze data and write up results with the goal of producing a conference presentation and/or a quality publication manuscript. <i>Prerequisite(s):</i> PSYC*7130, PSYC*7140, PSYC*7170. <i>Restriction(s):</i> Instructor's signature required
PSYC*8000 Clinical Internship U [0.00]
A mark of satisfactory (SAT) in this course indicates that a student in the Clinical Psychology: Applied Developmental Emphasis (CP:ADE) field has successfully completed a full year (1800-2000 hour) internship in an accredited clinical setting (e.g., CPA or APA) approved by the Director of Clinical Training for CP:ADE. <i>Prerequisite(s):</i> 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.

Rural Extension Studies

REXT*6060 Adult Learning and Development U [0.50]
Adult development through life stages; profile of adult learners; learning abilities and difficulties; learning theory as applied to adults; sociological contexts for adult learning; participation levels and barriers to participation. Various perspectives on adult learning (modernist to postmodern).

REXT*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: Human Resources Development and Participatory Development.
REXT*6190 Fundamentals of Interpersonal and Intercultural Communication U [0.50]
The role of communication in interpersonal and intercultural relations in both formal and non-formal organizations. It specifically focuses on the theories and competencies that are required for communication between individuals and those within and between different cultures.
REXT*6260 Research Methods 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.
REXT*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.
REXT*6311 Extension Theory and Methods U [0.50]
Theories, principles and practices associated with effective instruction in extension are taught. Emphasis is given to non-formal teaching-learning situations; importance of socio-economic and cultural environment; communication skills using creative and appropriate technology in the transfer of information.
REXT*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.
REXT*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. Visits to community-facilitated meetings will be part of the course.
REXT*6410 Readings in Capacity Building and Extension U [0.50]
A program of supervised independent study related to the student's area of concentration.
REXT*6420 Development Communication U [0.50]
Form of community development that utilizes communication technology in a participatory format with a political commitment to democracy and equity. Students introduced to range of technologies that are utilized in development communication (radio, video, Internet, etc.) and principles of development communication.
REXT*6690 Decision Making and Conflict U [0.50]
A systemic, comparative and interdisciplinary perspective, the linkage between decision processes, and conflict, both at the micro (community and interpersonal) level and at the broader macro level of structural change and globalization. Examines the theory and practice of socio-economic, cultural and political conflict in social systems and the modalities for its resolution from an interdisciplinary standpoint.
REXT*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.

Rural Planning and Development

RPD*6020 Rural Community Systems U [0.50]
This course familiarizes students with the particular characteristics of local rural community systems in Canada and how these vary over space and time. Emphasis is placed on defining rurality, the measurement of rural systems and on recognizing and dealing with informal elements in the rural community. A special section deals with preparing, as a professional, for work in such conditions. Credit may not be obtained for both GEOG*6270 and RPD*6020.

RPD*6030 International Rural development Planning: Principles and Practices U [0.50]
This course presents the scope and nature of international development planning and alternative roles for development planners; has a rural emphasis; reviews the evolution of development planning from macroeconomic beginnings to more integrated local planning approaches; examines the development planning process and its organizational and spatial dimensions; compares policy, program, project, sectoral and integrated area planning; and compares rural development planning in market, mixed and state-driven societies.
RPD*6040 Settlement Systems and Area Development Planning: Policies and Procedures U [0.50]
This course examines the issues, policies and procedures in settlement and area development. The focus is on lagging subnational rural areas in the international context. It discusses the determinants of settlement and area development and policies and strategies adopted to accelerate development. It presents procedures and selected techniques to develop such settlements and areas.
RPD*6060 Settlement, Housing, and Services: Planning and Management U [0.50]
This course provides an understanding of the issues, policies, and strategies in planning and managing a settlement. It teaches procedures and selected techniques. Topics include financing and managing the settlement, employment and the construction sector, land use, housing and services. The emphasis is on the international and rural context.
RPD*6070 Project Development: Principles, Procedures, and Selected Methods U [0.50]
This course introduces students to the principles, procedures and methods in developing a project. It examines the project cycle: identification, preparation, appraisal, implementation/supervision, monitoring and evaluation. It gives an understanding of the major methods involved and teaches selected methods. The focus is on the international, rural context and on small non-farm projects: small industries, small physical infrastructure and social projects.
RPD*6080 Environment and Development: Biophysical Resources and Sustainable Development in Rural Environments U [0.50]
This course will examine the problems and potential for ecologically sustainable development in the context of rural development planning particularly in the Third World environments. The course critically examines the strategic planning approaches and methods which involve the interaction between social systems and natural ecosystems in the context of planned intervention and change in rural environments.
RPD*6170 Philosophy and Methods in Rural Planning and Development Research U [0.50]
The course provides rural planning and development professionals with a number of theoretical frameworks and practical approaches to problem solving in rural Canadian and international contexts. The course content provides an introduction to hypothesis development, data collection, analytical frameworks, research management, and information synthesis and presentation methodologies that are appropriate to the practicing rural planner and developer. It views the roles of the researcher and research as interventionist and intervention in the rural community. Research methods are discussed as an integral and supporting part of the planning and development process.
RPD*6220 Rural Resources Policy U [0.50]
Contemporary resource use and environmental policy decisions at various scales; historical development of policy decisions; sociological, ecological and ethical considerations; evaluation of present and emerging policies.
RPD*6240 Planning and Development Theory U [0.50]
Examines basic concepts, theories and perspectives in rural planning and development. A conceptual examination of 'rural', 'planning' and 'development' precedes an examination of how rural planning and development is viewed from alternative, often conflicting theories of rural change and planned intervention. The implications for practice are discussed.
RPD*6250 Public Administration in Rural Communities U [0.50]
An introduction to the nature and problems of government and administration in the small municipality (less than 25,000). Major topics include: municipal law, capital budget and implementation, public services and infrastructure, personnel management.
RPD*6260 Land Use Planning Law U [0.50]
An introduction to the legal tools used to regulate the use of land and other resources. Zoning, subdivision controls, development control, land banking, expropriation, planning appeals, official maps, etc. An intensive study of the Ontario Planning Act and related legislation.
RPD*6280 Rural Planning Methods U [0.50]
Basics of rural planning practice, including communications, graphics, group dynamics, interviews and community surveys, questionnaire design and non-parametric statistics and role of citizen participation.

RPD*6290 Special Topics in Rural Planning and Development U [0.50]

Selected study topics focus on the nature of rural planning and development issues and/or practices in Canadian and/or International small communities and rural environments. Among the topics which may be addressed are: rural land use planning, ecological restoration, gender analysis in development planning, GIS in agricultural development and natural resource management, agropastoral systems, and agro-ecosystem health.

RPD*6300 Rural Planning Synthesis U [0.50]

The application of planning techniques and methodologies to various kinds of rural planning problems. Students prepare and present specific solutions to a practical problem in rural planning.

RPD*6310 Environmental Impact Assessment U [0.50]

This course deals with the role of environmental impact assessments and statements in the planning, development and operation of resource projects. Topics discussed include the philosophical and institutional basis for environmental impact assessments, methods used and the effects of such assessments on resource development projects.

RPD*6320 Water Resource Management U [0.50]

The course provides an assessment of the processes and principles which underlie comprehensive water resource planning and integrated basin management. It also undertakes to evaluate current practice in the context of integrated planning. There is extensive use of Canadian and international practice.

RPD*6350 Northern and Native Development and Planning U [0.50]

A critical analysis of development and planning in Northern Canada, including examination of policies and implementation strategies of governments and private enterprise; their impacts upon northern and native communities; and consideration of proactive locally based planning for community development.

RPD*6360 Major Research Paper U [1.00]

Students not pursuing the coursework/thesis route must satisfactorily complete a major research paper. Preparation of 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 in a theoretical context, and an analysis of the problem using appropriate methodological and analytical procedures. This will normally be equivalent to a two-semester course.

RPD*6370 Economic Development Planning and Management for Rural Communities U [0.50]

Theories and perspectives of local economic development, particularly community-based planning for rural economic development. Economic development within a community development framework, and challenges of sustainable development. Interdisciplinary perspectives and alternative approaches to professional planning practice, strategic planning, management and organizational design/development issues. Alternative economic concepts and perspectives are critically examined. Includes international case studies.

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

Analysis and application of standard quantitative, statistical and computer-based techniques utilized in rural planning and development. Problems of data collection, analysis and interpretation.

RPD*6390 Rural Social Planning U [0.50]

This course will provide students who have an interest in social development with an avenue for linking that interest to the policy, planning and intervention process.

RPD*6400 Synthesis: Seminar in Integrated Rural Development Planning U [0.50]

Field conditions for an integrated rural development project are simulated. Students work in multidisciplinary teams to plan, implement and evaluate the project. The Sulawesi Regional Development Project (Indonesia) is used (with other projects, as appropriate) as the case study.

RPD*6410 Readings in Rural Planning U [0.50]

A program of supervised independent study related to the student's area of concentration. Nature and content of the readings course are agreed upon between the student and the instructor, and are subject to the approval of the student's advisory committee and graduate committee.

RPD*6450 Recreation and Tourism Planning and Development U [0.50]

This course is intended to instruct the student in the principles of planning for recreation and tourism development. Emphasis is placed on the economic and social benefits and costs that accrue from tourism and recreation development. Planning principles are applied to this context.

RPD*6850 Graduate Diploma Field Studies S [0.25]

Students participate in a number of field experiences within the program. These experiences include study tours of rural regions, meetings with leading professional Canadian counterparts in counterpart rural organizations; study-visits to rural farms and industries; farm-stays and internships; and participation in professional and scholarly conferences. They write a report on the above, examining the lessons learned and their applicability (or lack of) to their own work context.

RPD*6900 Graduate Diploma Major Professional Paper S [0.50]

The paper will focus on the major interest area of the student, likely one he/she will return to practice in after graduation. It includes a review of the international literature and experience on the topic and compares this with the personal experience of the student and his/her organization and work context. Where appropriate, for example, when the student is returning to a specific organization, the student is encouraged to develop in the paper a work plan examining how to apply what is proposed in the paper and/or what was learned in the program to the work context the student is returning to.

Rural Studies**RST*6000 Sustainable Rural Communities F-W [1.00]**

Sustainable development theory in the rural communities and environment context.

RST*6100 Integrative Research Methods F-W [1.00]

Research design and evaluation with a focus on measures of sustainability and on interdisciplinary applications.

RST*6300 Research Seminar U [0.25]**RST*6500 Special Topics U [0.50]****Sociology****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*6130 Quantitative Research Methods W [0.50]

The application of multiple regression to data generated by nonexperimental 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.

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*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*6350 Society, Crime and Control U [0.50]

This seminar course surveys classical theoretical perspectives and more recent theoretical developments in the sociology of crime. It will examine the assumptions and logical structure of each perspective and justifications of particular criminal justice/public policy responses. The course will also critical assess recent empirical research relevant to each perspective.

SOC*6420 Development, Community and Rurality U [0.50]

This course will examine issues in different theories and models to explain rural and community change and persistence within a globalized system. While the emphasis will be on local continuity and change from a sociological and/or anthropological perspective, this will be discussed within a framework of international political economy. Case studies will be selected to illustrate different modes of change and resistance from different contexts. In particular, the role of community-led and participatory forms of development, social organization, social capital, land tenure, gender, agro-food systems, subsistence and commodification, governance, land use and environment management will be amongst topics considered. Students will be encouraged to focus their research on some of these issues in a geographical region of interest to them.

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*6480 Work 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 global economic change. Using case studies of particular work worlds, the course may include topics such as changing patterns of work in comparative contexts; labour discipline, organizations and protest; industrial and organizational change; education for work; economic restructuring and reconfigurations of gender, race and class within and beyond the shop floor.

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.

SOC*6700 Pro-seminar F-W [0.00]

The pro-seminar concerns matters involved in graduate studies and later work as a professional sociologist or anthropologist, including how to form a graduate advisory committee, assistantship responsibilities, presentation skills, exploration of careers in sociology and anthropology, writing grant proposals, reports and articles, and teaching. In the first semester students will begin to prepare research proposals for theses and major papers.

Statistics**STAT*6700 Stochastic Processes U [0.50]**

The content of this course is to introduce Brownian motion leading to the development of stochastic integrals thus providing a stochastic calculus. The content of this course will be delivered using concepts from measure theory and so familiarity with measures, measurable spaces, etc., will be assumed.

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 Advanced Data Analysis I U [0.50]

Residual analysis, deletion residuals, influential points, added variable plots, constructed variables, families of transformations, jackknife and bootstrap methods, local linear regression, regression splines and cubic smoothing splines.

STAT*6802 Advanced Data Analysis II U [0.50]

Generalized linear and generalized additive models, linear and nonlinear mixed effects models, parametric and semiparametric analysis of longitudinal and clustered data, generalized estimating equations, applications to categorical and spatial data.

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*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*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]****Toxicology****TOX*6000 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.

TOX*6530 Ecotoxicological Risk Characterization W [0.50]

A biologically based advanced course that will give students working knowledge of current procedures and techniques for ecotoxicological risk characterization. The course material will cover the topics: problem definition, dose response characterization, exposure characterization, and risk assessment and risk-management decision making. (Credit may be obtained for only one of TOX6530, ENVB6530 and TOX4550.) Department of Environmental Biology

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 TOX4590 and 9406590.) Department of Chemistry and Biochemistry

University Courses**UNIV*6000 The Structure and Function of Muscle U [0.50]**

An interdisciplinary course covering basic aspects of muscle from a range of viewpoints: structure, metabolism, protein content, energetics, mechanics, biological adaptations, growth and development. The course is designed for graduate students from a wide range of specific disciplines and will provide a broad background to muscle biology as well as more detailed insights into specific aspects of each area covered.

UNIV*6010 Regulation in Muscle Metabolism U [0.50]

An interdisciplinary course emphasizing the regulation of muscle metabolism in vivo. The course focuses on the integration of metabolic fuel utilization to meet cellular energy demands under a variety of conditions in the whole animal. Topics include: sources of energy demand, integration of energy supply to meet energy demands, and regulation of cell growth, maintenance and adaptation.

UNIV*6030 Selected Topics in Animal Welfare U [0.50]

This course provides for an interdisciplinary forum for the discussion of topics in animal welfare. Selected topics will be analyzed in depth with input from various disciplines such as animal science, biology, philosophy, psychology, and economics. An introductory lecture for registered students will be followed by six 2-hour seminars which will be open to the university community (advertised through the Centre for the Study of Animal Welfare, CSAW). Proceedings from the course, including papers prepared by registered students, will be published.

UNIV*6500 International Study Option U [0.00]

A period of study in another country as part of a graduate program at the University of Guelph. Details may be obtained from Graduate Program Services.

UNIV*6600 Animal Care Short Course W [0.00]

A one-day seminar covering the following topics: Animal Welfare Philosophy, Ethological Considerations in Animal Management, Assessing Animal Welfare, Ethical Dilemmas, Regulations and Legislation, Euthanasia, Improving Statistical Power, Zoonoses and Biohazards, Recognition and Alleviation of Pain and Distress in Animals, Case Study Evaluation.

UNIV*6710 Commercialization of Innovation F [0.50]

This course is designed to help participants better understand the process, the analytical tools that can assist the process and how best to prepare technologies to survive commercialization. The course includes elements of entrepreneurship, relationship building, organizational change, as well as project and personnel management.

UNIV*6800 University Teaching: Theory and Practice F-W [0.50]

Participants will critically examine aspects of teaching in higher education and develop teaching skills such as lecturing, demonstrating, leading discussions, and problem solving. Satisfactory (SAT) or unsatisfactory (UNS) will be used to evaluate the student's performance in this course.

Zoology**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*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*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*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.

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.

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 botany and zoology 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 botany and zoology 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*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.

IBIO*6100 Molecular Evolution U [0.50]

This course is designed to provide students with an appreciation for the uses of molecular data in the study of evolutionary processes. An overview of the principles of molecular data analysis using a phylogenetic approach will be given. In addition, the importance of incorporating evolutionary history into biodiversity research and other applied topics will be emphasized. Laboratory sessions will be devoted to practical training in analytical tools using specialized computer software, and for student presentation of independent research projects. The course will involve practical training in molecular data analysis using a phylogenetic approach and discussion of current topics from the primary literature

IBIO*6630 Scientific Communication I U [0.75]

The development and refinement of the skills of scientific communication, emphasizing writing skills, in the context of developing a thesis proposal.

IBIO*6640 Scientific Communication II U [0.25]

The development and refinement of the skills of scientific communication, emphasizing oral skills, and culminating in the defence of the thesis proposal.

ZOO*6550 Aquaculture U [0.50]

Examination of the history, practice and future of aquaculture with special reference to the application of biological principles and knowledge to the production of aquatic organisms for food and other uses.

Revisions

On the basis of information received from the Board of Graduate Studies, colleges or departments, the 2004-2006 Graduate Calendar includes the following revisions:

Note

Those who may have used the PDFs to download and print off these calendar sections are advised to re-print the revised sections accordingly. Please be aware sectioning, page numbering, table of contents may have changed.

March 25, 2004

Initial Publication of 2004-2006 Graduate Calendar

June 18, 2004

Chapter II General Regulations

Modifications were made throughout entire chapter.

Chapter IV Degree Regulations

Modifications were made throughout entire chapter.

Chapter VII Fees

Changes to University Non-Academic Fees

Chapter VIII Graduate Programs

Addition of charts for Degree Programs listed by College and Division.

The following modifications were made:

- UNIV*6710 Commercialization of Innovation: new course
- AGBU*6510: title change and added restriction.
- ENGG*6080 Engineering Seminar: SAT/UNS for grade
- ENGG*6160 Advanced Food Engineering: remove prerequisite
- FRAN*6180 Resarch in Couple and Family Assessment and Intervention: new course
- CROP*6010 Physiology of Crop Yield: offered even years
- CROP*6400 Seminar: change in credit (previous typing error)
- CROP*6500 Applied Bioinformatics: new course
- FRAN*6070: instructor signature required.
- FSQA*6000 Food Safety and Quality Assurance Seminar: change in credit (previous typing error)
- HBNS*6320: semester designation change.
- HTM*6140 Foundations of Human Resource Management: new course
- HTM*6170 Hospitality and Tourism Economics and Policy: new course
- HTM*6510 Hospitality and Tourism Revenue Management: new course
- HTM*6530 Safety, Security and Risk Assessment in HTM: new course
- HTM*6550 Managing Service Quality: new course
- HTM*6110 Foundations of Leadership: title and description changes
- HTM*6150 Research Methods for Managers: title and description changes
- HTM*6800 Operations Management: title and description changes
- HTM*6300 Hospitality and Tourism Marketing: title and semester offered changes
- HTM*6700 Hospitality and Tourism Strategic Management: title and semester offered changes
- HTM*6900 Major Paper: credit change
- HTM*6100 Organizational Theory and Design: course deletion
- HTM*6230 Special Topics in Management Issues: course deletion
- PHIL*6600: title change
- PSYC*6060, PSYC*6750, PSYC*6780: added restriction.
- PSYC*6770: pre-requisite added.
- PSYC*7070, PSYC*7170, PSYC*7180: instructor's signature required.

Philosophy courses for Wilfrid Laurier University: title changes for some courses

Chapter X Graduate Awards and Financial Assistance

The following revisions were made:

- Department of History Graduate Prizes: \$100 prizes will be awarded.
- Brock Doctoral Scholarship
- Name change: Merial Graduate Scholarship (formerly Merck-Agvet Scholarship)
- Lilian and James Allan Scholarship (Food Science) (deadline June 1)

The following awards were added:

- Ajinomoto Heartland/Halchemix Scholarship (OAC)
- Guelph Compassionate Health Bursary (University wide)
- Lilian and James Allan Scholarship (OAC)
- The Bell-Sargant Scholarship (Landscape Architecture)

2004-2006 University of Guelph Graduate Calendar

- D. Marie Taylor Memorial Scholarship (CSAHS)
- Lin Coburn Memorial Graduate Scholarship (Arts)
- Arts Alumni Doctoral Entrance Scholarship
- CBS Alumni Doctoral Entrance Scholarship
- CPES Alumni Doctoral Entrance Scholarship
- CSAHS Alumni Doctoral Entrance Scholarship
- OAC Alumni Doctoral Entrance Scholarship
- OVC Alumni Doctoral Entrance Scholarship

September 17, 2004

Chapter II General Regulations

The following revisions were made:

- Grade Interpretation: 80-89 = (A- to A)
- Application for Admission: English Proficiency: revision to wording

Chapter X Graduate Awards and Financial Assistance

The following revisions were made:

- Angelo and Frank Agro Graduate Scholarship: deleted
- Betty King Memorial Scholarship: amendment to amount awarded
- MAC '38 Gerontology Graduate Scholarships (FRAN): amendment to number of awards
- Tri-University History Doctoral Awards (ARTS) amount increased to \$100

December 10, 2004

Chapter I Schedule of Dates

The following revision was made:

- The addition of the schedule for Summer 2005, Fall 2005, Winter 2006

Chapter II General Regulations

The following revision was made:

- Application for Admission: English Proficiency: revision to wording

Chapter VIII Graduate Programs

The following modifications were made:

- Agricultural Economics and Business: editorial changes to PhD Degree Requirements
- AGBU*6070 Research Methods for Managers: new course
- AGBU*6100 Food and Agribusiness Economics and Policy: course change
- AGBU*6120 Marketing Management: new course
- AGBU*6180 Financial and Managerial Accounting: new course
- AGBU*6200 Financial Management: course change
- AGBU*6400 Food and Agribusiness Strategic Management: course change
- FRAN*6550 Research Seminar: course change
- HIST*6450 Quantitative Evidence and Historical Methods: new course
- COST*6720 Special Topics in Housing and Real Estate: new course
- Philosophy: editorial changes to MA Admission Requirements
- POLS*6960 Directed Readings: new course
- PSYC*8000 Clinical Internship: new course
- Resource and Environmental Economics: editorial changes to PhD Program Description

Chapter X Graduate Awards and Financial Assistance

The following revisions were made:

- Alumni Doctoral Entrance Scholarship (OAC): deletion
- Marian Brennan and Hedley Harrision Memorial Scholarship (OAC): addition
- J. Ross Cavers International Exchange Research Grant (OAC): deletion
- J. Ross Cavers Research Travel Grants in Poultry Science (OAC): deletion
- Dairy Farmers of Ontario Doctoral Research Assistantship: revision
- Joan Doherty Travel Scholarship (CSAHS): addition
- Ploughshare Scholarship (OAC): description correction
- Quality Management Institute Graduate Scholarship (CSAHS): deletion
- Tony Scherman Graduate Scholarship (COA): addition
- Maurice and Catherine Smith Award (OAC): increase to \$1000 award
- The John Vanderkamp Graduate Medal (CSAHS): CSAHS designation
- Vétoquinol Scholarship in Geriatrics (OVC): addition
- Vétoquinol Scholarship in Swine Health (OVC): addition
- Waltham Scholarship (OVC): deletion

May 10, 2005

Addition of Appendix

Chapter VIII Graduate Programs

The following modifications were made:

Agricultural Economics and Business: MSc admission and degree requirements changes

AGEC*6080 Information Systems in Agribusiness: deletion

AGEC*6090 Small Business Taxation: deletion

AGEC*6141 Business Policy: deletion

Agriculture: degree requirements changes.

Business Studies: admission, degree and course requirements changes.

CLIN*6200 Concepts and Application of Infection Control: new course

CLIN*6280 Advanced Equine Veterinary Orthopaedics I: deletion

CLIN*6290 Advanced Equine Veterinary Orthopaedics II: deletion

CLIN*6310 Advanced Equine Veterinary Orthopaedics: new course

CROP*6010 Physiology of Crop Yield renamed: PLNT*6010

CROP*6050 Cytogenetics in Plant Breeding deletion

CROP*6060 Cytogenetics in Plant Breeding Laboratory deletion

CROP*6100 Advanced Crop Breeding renamed: PLNT*6100

CROP*6120 Protein and Oilseed Crop Breeding renamed: PLNT*6120

CROP*6130 Corn Breeding renamed: PLNT*6130

CROP*6150 Plant Breeding - The Profession renamed: PLNT*6150

CROP*6160 Quantitative Genetic Variation in Crop Populations renamed: PLNT*6160

CROP*6170 Statistics in Plant Breeding renamed: PLNT*6170 Statistics in Plant Agriculture

CROP*6180 Application of Plant Breeding Principles deletion

CROP*6230 Colloquium in Crop Physiology and Management renamed: PLNT*6230

CROP*6250 Colloquium in Genetics, Cytogenetics, and Plant Breeding renamed: PLNT*6250

CROP*6260 Advanced Crop Genetics renamed: PLNT*6260

CROP*6240 Colloquium on Weed Management in Agrosystems renamed: PLNT*6240

CROP*6020 Issues in Food Safety Risk Analysis renamed: PLNT*6020

CROP*6300 Current Research Problems and Field Techniques deletion

CROP*6400 Seminar renamed: PLNT*6400

CROP*6500 Applied Bioinformatics renamed: PLNT*6500

CROP*6660 Teaching Practicum in Crop Science deletion

FRAN*6450 Cultural Perspectives on the Family: new course

Fine Art: admission requirements changes.

Food Safety and Quality Assurance: degree requirements changes

FSQA*6500 Food Safety and Quality Assurance Research Project: single course (not double course)

History: MA degree requirements change.

HTM*6510 Hospitality and Tourism Revenue Management: delete co-requisite

HTM*6100 Organizational Theory and Design: deletion

HTM*6110 Foundations of Leadership: title change

HORT*6170 Postharvest Physiology renamed: PLNT*6110

HORT*6220 Advanced Studies in Pomology renamed: PLNT*6220

HORT*6480 deletion

HORT*6490 Colloquium in Physiology of Ornamental Crops renamed: PLNT*6490

HORT*6000 deletion

HORT*6050 Principles and Application of Plant Tissue Culture renamed: PLNT*6050

HORT*6500 Seminar renamed: PLNT*6410 Applied Bioinformatics and revision

International Development Studies: GEOG*6340 Human Environment Systems Analysis: core course deletion

PHIL*6580 Clinical Internship in Bioethicist: deletion

Physics: MSc and PhD admission and degree requirements changes.

PHYS*7030 Introduction to Quantum Field Theory: calendar description change

PHYS*7840 Advanced General Relativity: new course

PHYS*7850 Quantum Field Theory for Cosmology: new course

PHYS*7860 General Relativity for Cosmology: new course

PHYS*7970 MSc Project: credit change

PHYS*8900 Interuniversity Graduate Course in Biophysics: deletion from Biophysics program only

Political Science: application procedure changes.

Psychology: admission and degree requirements changes.

PSYC*6020 Clinical and Diagnostic Interviewing Skills: new course

PSYC*6890 Legislation and Professional Practice: new course

Rural Studies: degree requirements changes.

Sociology and Anthropology: application procedure changes, admission and degree requirements changes.

Chapter X Graduate Awards and Financial Assistance

The following revisions were made:

A.W. Archibald Memorial Bursary (OAC): deletion

Arts Alumni Doctoral Entrance (ARTS): deletion

David and Carolyn Biesenthal Scholarship (OAC): addition

Bio-Research Laboratories Scholarship (OVC): deletion

CBS Alumni Doctoral Entrance Scholarship (CBS): deletion

CPES Alumni Doctoral Entrance Scholarship (CPES): deletion

CSAHS Alumni Doctoral Entrance Scholarship (CSAHS): deletion

Pearl Lyons Memorial Scholarship (OAC): addition

Dr. J.F. McCorquodale Scholarship (OVC): deletion

Kiyoko Miyanishi Graduate Geography Scholarship (CSAHS): addition

Quinn Memorial Scholarship (OAC): addition

N.R. Richards Scholarship (OAC): revision

OAC Alumni Doctoral Entrance Scholarship (OAC): deletion

OVC Alumni Doctoral Entrance Scholarship (OVC): deletion

Rogar/STB Scholarship (OVC): deletion

Yeandle Family In-Course Bursaries (CSAHS): revision

June 28, 2005

Chapter VIII Graduate Programs

The following modifications were made:

AGEC*6411 Operations Management II: deletion

CROP*6050 Cytogenetics in Plant Breeding: deletion

CROP*6060 Cytogenetics in Plant Breeding Laboratory: deletion

CROP*6180 Application of Plant Breeding Principles: deletion

CROP*6300 Current Research Problems and Field Techniques: deletion

CROP*6660 Teaching Practicum in Crop Science: deletion

HORT*6000 Projects in Horticultural Science: deletion

HORT*6480 Colloquium in the Environmental Physiology of Horticultural Plants: deletion

HIST*6080 Topics in Tudor-Stuart History: deletion

HIST*6150 Scottish Archival Research: new course

HIST*6090 The Reformation in the 16th Century: deletion

HIST*6190 Topics in Scottish History I: course title & description change

HIST*6200 Topics in Scottish History II: new course

HIST*6230 Canadian History I: course title & description change

HIST*6310 Topics in Modern Europe II: new course

HIST*6280 Canadian History II: course title & description change

HIST*6300 Topics in Modern Europe I: course title & description change

HIST*6340 The Enlightenment: deletion

HIST*6370 Topics in Cultural History: course title & description change

HIST*6380 Topics in Early Modern European History: new course

HIST*6390 Historical Conceptions of the City: deletion

HIST*6500 Topics in Global History: new course

HIST*6520 Topics in Latin American History: new course

HIST*6540 Topics in South Asian History: new course

PHYS*7470 Optical Electronics: course title change

PLNT*6250 Colloquium in Genetics, Biotechnology and Plant Breeding: course title & description change

POP*6230 Applied Clinical Research: new course

Chapter X Graduate Awards and Financial Assistance

The following revisions were made:

Mrs. Fred Ball Scholarship: revision

Herbert F. Crown Memorial Scholarship for Conservation and Rural Development: revision

The Jane Nelson Stirling Cairns Grier Scholarship in Scottish Studies: addition

Robert J. Hall Memorial Poultry Scholarship: revision

H.H. Harshman Foundation Doctoral Scholarship: revision

F.W. Karasek Scholarship: addition

Ontario Egg Producers' Thomas R. Graham Scholarship: addition

September 2, 2005

Chapter VIII Graduate Programs

The following modifications were made:

- BOT*6301 Plant Ecology: deletion
- BOT*6404 Theoretical Plant Biology: deletion
- BOT*6406 Restoration Ecology: deletion
- BOT*6412 Evolutionary Ecology: deletion
- BOT*6501 Topics in Flowering Plant Morphology: deletion
- BOT*6800 Seminar I: deletion
- BOT*6801 Seminar II: deletion
- Computing and Information Science: PhD seminar requirement change
- HTM*6210 Hospitality Facilities and Systems: Planning and Development: deletion
- HTM*6400 Managing International Hospitality Institutions: deletion
- MCB*6010 Advanced Topics in Biochemistry: new course
- MCB*6110 Protein Structural Biology and Bioinformatics
- MCB*6210 Structure and Function of Biological Membranes: new course
- POPM*6290 Statistics for the Health Sciences: title and description changes and pre-requisite added
- ZOO*6000 Advances in Ecology and Behaviour : renamed IBIO*6000 Special Topics in Ecology
- ZOO*6010 Advances in Physiology: renamed IBIO*6010
- ZOO*6020 Advances in Evolution: renamed IBIO*6020
- ZOO*6040 Special Topics in Animal Ecology: renamed IBIO*6040 and revision
- ZOO*6060 Special Topics in Evolution: renamed IBIO*6060
- ZOO*6070 Topics in Advance Zoology I: renamed IBIO*6070 Topics in Advanced Integrative Biology I and revision
- ZOO*6080 Topics in Advance Zoology II: renamed IBIO*6080 Topics in Advanced Integrative Biology II and revision
- ZOO*6090 Special Topics in Physiological Zoology: renamed IBIO*6090 Special Topics in Physiology and revision
- ZOO*6630 Scientific Communication: renamed IBIO*6630 Scientific Communication I and revision
- ZOO*6640 Graduate Seminar: renamed IBIO*6640 Scientific Communication II and revision

Chapter X Graduate Awards and Financial Assistance

The following modifications were made:

- Angela and Frank Agro Memorial OGS Fund: addition
- Bayer CropScience OGS Fund: addition
- Iлона Diener Memorial OGS Fund: addition
- Dr. John and Joan Gandier Memorial OGS Fund: addition
- Anna Hovanec OGS Fund: addition
- Val Hovanec OGS Fund: addition
- Syngenta OGS Fund: addition
- TD Bank Financial Group OGS Fund: name change

December 1, 2005

Chapter VIII Graduate Programs

The following modifications were made:

- ANTH*6460 Gender and Development: semester designation change
- Computing and Information Science: MSc and PhD admission and degree requirements changes
- CIS*6660 Topics in Computer Science II: description change
- CIS*6890 Technical Comm. and Research Methodology: addition
- CIS*6900 Computer Science Seminar: deletion
- ENVB*6570 Pesticide Toxicology Colloquium: deletion
- FRAN*6090 Practicum in Couple: description change
- FRAN*6095 Externship in Couple and Family Therapy description change
- FRAN*6100 Clinical Issues in Couple and Family Therapy: description change
- MICR*6250 Monoclonal Antibodies and Antibody Engineering: deletion
- PABI*6350 Molecular Epidemiology of Bacterial Diseases: addition
- Philosophy: PhD degree requirement change
- PLNT*6030 Food Safety Policy: addition
- SOC*6350 Society, Crime and Control: name change
- SOC*6460 Gender and Development: semester designation change
- Sociology and Anthropology: application deadline change

Chapter X Graduate Awards and Financial Assistance

The following modifications were made:

- Wilda M. Blacklock Award: revision
- Canadian Society of Landscape Architects Prize: addition
- Margaret Hedley Graduate Scholarship in Applied Nutrition: addition
- The Keyes Family Scholarship: addition
- Lambda Foundation Scholarship in LBGT Studies: addition
- W.G. Matthewman Scholarship: addition
- Dr. O.M. McConkey Scholarship: revision
- Kiyoko Miyanishi Graduate Geography Scholarship: revision
- Larry Peterson Graduate Scholarship in Botany: deletion

December 23, 2005

Chapter VIII Graduate Programs

The following modifications were made:

- BIOP*6950 Advanced Topics in Biophysics: addition
- ENVB*6190 Environmental Microbial Technology: restriction

Chapter X Graduate Awards and Financial Assistance

The following modifications were made:

- Brock Doctoral Scholarship: revision
- H.H. Harshman Foundation Doctoral Scholarship: revision
- H.H. Harshman Graduate Scholarship: revision
- Kiyoko Miyanishi Graduate Geography Scholarship: revision
- Starwood Hotels & Resorts Graduate Scholarship: name change
- Warren Stein Memorial Scholarship: deletion

The following awards were added:

- GCORI Graduate Scholarship in Industrial Organizational Psychology
- The Edward Stewart Scholarship in Scottish Studies

February 17, 2006

Chapter I Schedule of Dates

The following modification was made:

- Summer Semester 2006 - addition

Chapter X Graduate Awards and Financial Assistance

The following modifications were made:

- Prof. A.W. Baker Memorial Bursaries (OAC): revision
- Department of Economics Graduate Scholarships: revision
- Bill Graf International Development Field Research Grant (POLS): revision
- Alf and Mary Hales Graduate Scholarship in Political Studies: revision
- James Harris Scholarship (Animal Science): revision
- College of Arts Graduate Research Bursary: revision
- John Galt Scholarships (History): revision
- The Lady Glencora Bursaries (OVC): revision
- Milton Travel Scholarship (OVC): formerly Research Travel Grants
- Northwater Capital Management Travel Research Grant in Aging (FRAN): revision
- Ontario Food Protection Association Graduate Bursaries in Food Safety: revision
- Ontario Food Protection Association Millenium Scholarship (Food Safety and Quality Assurance): deletion
- Helen O'Reilly History Scholarship (History): revision
- Scottish Studies Foundation Graduate Scholarship: revision
- Harry Zimmerman Memorial Scholarship in GWC2: revision