

2006-2007 Graduate Calendar

The information published in this Graduate Calendar outlines the rules, regulations, curricula, programs and fees for the 2006-2007 academic years, including the Summer Semester 2006, the Fall Semester 2006, the Winter Semester 2007 and the Summer 2007.

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](#).

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- The Association of Universities and Colleges of Canada

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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.

Table of Contents

Botany	41
MSc Program	41
PhD Program	41
Courses	41

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** -- 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.

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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

Andrew MacDougall

BA Dalhousie, MSc York, PhD British Columbia - Assistant 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

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 - Associate 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. IBIO*6630 Scientific Communication I and IBIO*6640 Scientific Communication II are mandatory for MSc students in the Department of Integrative Biology. 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. MSc students in the Department of Integrative Biology must take IBIO*6630 and IBIO*6640 as mentioned above. MSc students in the Department of Molecular and Cellular Biology may take MBG*6080 Research Topics 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 nine semesters.

Courses

Plant Physiology

BOT*6403 Seed Development and Germination 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 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.

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 PBIO*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.

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. This course is mandatory for MSc students in the Department of Integrative Biology.

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. This course is mandatory for MSc students in the Department of Integrative Biology.

Additional courses within the Department of Molecular and Cellular Biology can be found under the course descriptions for the Molecular Biology and Genetics graduate program and the Microbiology graduate program.