

# 2017-2018 Graduate Calendar

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

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

If you wish to link to the Graduate Calendar please refer to the [Linking Guidelines](#).

The University is a full member of:

- The Association of Universities and Colleges of Canada

Contact Information:

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

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The logo for the University of Guelph, featuring the text "UNIVERSITY of GUELPH" in a stylized font.The tagline "CHANGING LIVES IMPROVING LIFE" in a bold, sans-serif font, positioned below the university logo.

## **Disclaimer**

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

## **Limitations**

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

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

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

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

## **Introduction**

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### **Collection, Use and Disclosure of Personal Information**

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

### **Statistics Canada - Notification of Disclosure**

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

### **Address for University Communication**

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

#### **Email Address**

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

#### **Home Address**

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

### **Name Changes**

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

### **Student Confidentiality and Release of Student Information Policy Excerpt**

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

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



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## Biotechnology

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

### Administrative Staff

#### Director

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

#### Graduate Program Coordinator

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

#### Graduate Program Assistant

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

### Graduate Faculty

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

##### Michael von Massow

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

#### From the Department of Integrative Biology

##### Robert Hanner

BSc Eastern Michigan, PhD Oregon - Associate Professor

##### Steven G. Newmaster

BSc Guelph, PhD Alberta - Associate Professor

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

##### Tariq Akhtar

BSc, MSc Waterloo, PhD Florida - Assistant Professor

##### Emma Allen-Vercoe

BSc London UK, PhD Open UK - Professor

##### Anthony J. Clarke

BSc, MSc, PhD Waterloo - Professor

##### Joseph L. Colasanti

BSc, PhD Western Ontario - Associate Professor

##### Marc Coppolino

BSc Waterloo, MSc, PhD Toronto - Associate Professor

##### John Dawson

BSc Wilfrid Laurier, PhD Alberta - Associate Professor

##### Michael J. Emes

BSc, PhD Sheffield - Professor

##### Steffen P. Graether

BSc, MSc, PhD Queen's - Associate Professor

##### George Harauz

BA, MSc, PhD Toronto - Professor

##### Nina Jones

BSc Guelph, PhD Toronto - Associate Professor

##### David Josephy

BSc Toronto, PhD British Columbia - Professor

##### Azad Kaushik

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

##### Cezar Khursigara

BSc Ryerson, PhD McGill - Assistant Professor

##### Matthew S. Kimber

BSc, PhD Toronto - Associate Professor

##### Peter J. Krell

BSc, MSc Carleton, PhD Dalhousie - Professor

##### Joseph S.L. Lam

BSc, PhD Calgary - Professor

##### Ray Lu

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

##### Jaideep Mathur

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

##### Baozhong Meng

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

##### Rod Merrill

BSc Lethbridge, PhD Ottawa - Professor

##### Richard D. Mosser

BSc, PhD Waterloo - Associate Professor

##### Robert T. Mullen

BSc, PhD Alberta - Professor

##### Lucy M. Mutharia

BSc, MSc Nairobi, PhD British Columbia - Associate Professor

##### Annette Nassuth

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

##### Melissa Perreault

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

##### Steven Rothstein

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

##### Scott Ryan

BSc Memorial, PhD Ottawa - Assistant Professor

##### Stephen Y.K. Seah

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

##### Ian Tetlow

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

##### James Uniacke

BSc, PhD Concordia University - Assistant Professor

##### George van der Merwe

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

##### Terry Van Raay

BSc Windsor, MSc Guelph, PhD Utah - Assistant Professor

##### John Vessey

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

##### Christopher Whitfield

BSc Newcastle, PhD Edinburgh - Professor

##### Krassimir (Joseph) Yankulov

BSc Sophia, PhD ICRF London - Associate Professor

#### From the Department of Management

##### Elliott Currie

BA, MBA McMaster, CMA - Associate Professor

##### Fred Pries

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

##### Davar Rezanian

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

##### Trent Tucker

BSc Alberta, MBA Toronto, PhD Waterloo - Assistant Professor

#### From the Department of Physics

##### John R. Dutcher

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

### MBIOT Program

#### Admission Requirements

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

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

## Admissions Process

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

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

## Degree Requirements

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

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

## Duration of the Program

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

## Courses

### Core Courses

#### BIOT\*6500 Molecular Biotechnology F [0.50]

This course will provide an overview of molecular approaches relevant to a broad range of biotechnology industries including those found in medical, microbial, protein, pharmaceutical, environmental and agricultural fields.

*Department(s):* Department of Molecular and Cellular Biology

#### BIOT\*6550 Biodiversity and Biotechnology W [0.50]

Biological diversity includes the variability among living organisms spanning genetic, species, habitat and geographic scales, thereby encompassing all living things and associated systems. This course will provide an overview of DNA-based approaches used to analyze and characterize the main principles of biodiversity followed by discussions of the impact of biologically diverse communities within the biotechnology sector.

*Department(s):* Department of Molecular and Cellular Biology

#### BIOT\*6600 Innovation Management F [0.50]

This course will focus on the integration of science and business from initial discovery through to commercialization. This integration involves resolving issues related to technical, market and financial feasibility. Topics will include the innovation process, assessment of markets, development of business models and managing projects under high uncertainty.

*Department(s):* Department of Management

#### BIOT\*6610 Cases in Biotechnology Management W [0.50]

This course will examine contemporary issues in biotechnology / science-based business through a case-based approach. Topics from across the spectrum of business disciplines (marketing, management, strategy, intellectual property, etc.) will be examined. Time permitting, a live case with an industry partner will be used.

*Prerequisite(s):* BIOT\*6600

*Department(s):* Department of Management

#### BIOT\*6700 Communication in Science and Business W [0.50]

The goal of this course is to develop written, and oral presentation skills to effectively communicate ideas and experiments in both scientific and business contexts. Students will be asked to write and orally communicate a research proposal.

*Department(s):* Department of Molecular and Cellular Biology

#### BIOT\*6800 Research Project S [1.00]

The students will be matched with a research advisor in their first semester and write a research proposal on their project in the second semester communication course. During the time they do their research project, they will be expected to do the research work that they propose and then to prepare a written report of their results and conclusions as well as to give a poster presentation on this. The research project can be undertaken with any appropriate faculty member, or with an approved off-campus institution.

*Restriction(s):* Students registered in Master of Biotechnology program

*Department(s):* Department of Molecular and Cellular Biology

## Electives

### College of Biological Sciences

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

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

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

## Bioinformatics

BINF\*6110 [0.50] Genomic Methods for Bioinformatics

BINF\*6210 [0.50] Software Tools for Biological Data Analysis and Organization

## College of Business and Economics

UNIV\*6050 [1.00] The Integration of Science and Business in Agrifood Systems

MGMT\*6100 [0.50] Evidence Based Management Research

MGMT\*6200 [0.50] Leadership Assessment and Development

MGMT\*6300 [0.50] Business Consulting

MGMT\*6400 [0.50] Project Management

## Ontario Agricultural College

ANSC\*6450 [0.50] Topics in Animal Biotechnology

ENVS\*6040 [0.50] Molecular Basis of Plant-Microbe Interactions

PLNT\*6500 [0.50] Applied Bioinformatics