

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

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UNIVERSITY
of GUELPH

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IMPROVING LIFE

Disclaimer

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

Limitations

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

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

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

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

Introduction

Collection, Use and Disclosure of Personal Information

Personal information is collected under the authority of the University of Guelph Act (1964), and in accordance with Ontario's Freedom of Information and Protection of Privacy Act (FIPPA) http://www.e-laws.gov.on.ca/DBLaws/Statutes/English/90f31_e.htm. This information is used by University officials in order to carry out their authorized academic and administrative responsibilities and also to establish a relationship for alumni and development purposes. Certain personal information is disclosed to external agencies, including the Ontario Universities Application Centre, the Ministry of 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

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

Address for University Communication

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

Email Address

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

Home Address

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

Name Changes

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

Student Confidentiality and Release of Student Information Policy Excerpt

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

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

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Bioinformatics

Bioinformatics is the development and application of computational and statistical techniques for solving problems involving complex biological data. This emerging discipline is growing rapidly alongside technological developments for large-scale data generation in the life sciences, such as in genomics, proteomics, functional pathway analysis, health sciences, and biodiversity. Demand is accelerating for new approaches for data storage, retrieval, analysis, and applications. A new generation of professionals is required to meet this demand, having bioinformatics skills and the capacity to create new approaches.

Administrative Staff

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MBINF Program

Admission Requirements

Students will be admitted to the Master of Bioinformatics program from a range of undergraduate programs in the life sciences. Students from undergraduate programs in the physical or computational sciences will be considered for admission if they are considered to have sufficient biological background. Students must begin the Master of Bioinformatics program in a fall semester. To be considered for admission, applicants should meet the minimum requirements of a four-year degree from a recognized post-secondary institution with a minimum 75% average over the last two years of full-time equivalent study.

Space in the program is limited and prospective students are encouraged to apply as early as possible. Application details are posted on the [program website](#).

Degree Requirements

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

| | | |
|-----------|--------|--|
| BINF*6110 | [0.50] | Genomic Methods for Bioinformatics |
| BINF*6210 | [0.50] | Software Tools for Biological Data Analysis and Organization |
| BINF*6890 | [0.50] | Topics in Bioinformatics |
| BINF*6970 | [0.50] | Statistical Bioinformatics |
| BINF*6999 | [1.00] | Bioinformatics Master's Project |

The advisory committee and/or the Graduate Program Committee may require additional courses.

Advisory Committee

Students taking the Master of Bioinformatics will have an advisor and a co-advisor. Both the advisor and the co-advisor must be members of the Bioinformatics Graduate Faculty such that one has expertise in the life sciences and the other has expertise in statistics or computing.

Duration of the Program

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

MSc Program

Admission Requirements

Students may be admitted to the MSc in Bioinformatics program from a range of undergraduate programs in the life, physical, statistical, mathematical, and computational sciences. To be considered for admission, applicants should meet the minimum requirements of a four-year degree from a recognized post-secondary institution with a minimum 75% average over the last two years of full-time equivalent study.

Applicants should indicate their research interests and their preferred advisors. Prospective students are encouraged to speak with potential advisors before applying to the MSc program. Offers of admission will only be issued in cases where a member of Bioinformatics Graduate Faculty has agreed to be the advisor.

Degree Requirements

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

| | | |
|-----------|--------|--|
| BINF*6110 | [0.50] | Genomic Methods for Bioinformatics |
| BINF*6210 | [0.50] | Software Tools for Biological Data Analysis and Organization |

The advisory committee and/or the Graduate Program Committee may require additional courses. When the course work is satisfactorily completed, the submission and successful defence of an appropriate thesis on an approved topic completes the requirements for the MSc in Bioinformatics.

Advisory Committee

Students taking the MSc in Bioinformatics will have an advisory committee comprising at least two members of the Bioinformatics Graduate Faculty. The advisor must be a member of the Bioinformatics Graduate Faculty.

Duration of the Program

The program typically takes 16-24 months of full-time study.

PhD Program

Admission Requirements

1. Applicants with a master's degree

Applicants holding either a Master of Bioinformatics, an MSc in Bioinformatics, or a masters in a related discipline with a GPA above 80 over the last two years equivalent of full time study will be considered for admission.

2. Applicants without a master's degree (i.e., direct entry)

Strong applicants (GPA>80) may be admitted without holding a master's degree provided that their undergraduate major is appropriate. In these cases, the program committee will assign necessary courses to ensure sufficient preparedness for research.

3. General Requirements

Before a recommendation of admission can be issued, applicants are encouraged to speak with potential advisors before applying to the PhD in Bioinformatics program.

Degree Requirements

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

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

The program committee and the advisory committee may, and usually will, require additional courses. After the prescribed course work is satisfactorily completed, a qualifying examination is taken. Finally, the submission and successful defence of an appropriate thesis on an approved topic completes the requirements for the PhD in Bioinformatics.

Advisory Committee

Students taking the PhD in Bioinformatics will have an advisory committee comprising at least three members of the Graduate Faculty, two of whom should be Bioinformatics Graduate Faculty. The advisor must be a member of the Bioinformatics Graduate Faculty. Usually, if there is a co-advisor, (s)he will also be a member of the Bioinformatics Graduate Faculty; under special circumstances, the Director, after consultation with the Bioinformatics Program Committee, may approve a co-advisor who is not a member of the Bioinformatics Graduate Faculty.

Duration of the Program

The completion period of the program is 12 semesters of full-time study.

Courses

Bioinformatics Core Courses

| |
|--|
| BINF*6110 Genomic Methods for Bioinformatics W [0.50] |
| This course provides an introduction to current and emerging methods used to generate genomic data analyzed in bioinformatics. This may include techniques for DNA sequencing as well as transcriptome, proteome and metabolome analysis. The objective is to develop an appreciation for the challenges of producing data. |
| <i>Restriction(s):</i> Restricted to students in Bioinformatics programs. Students in other programs may consult with course instructor. |
| <i>Department(s):</i> Dean's Office, College of Biological Science |
| BINF*6210 Software Tools for Biological Data Analysis and Organization F [0.50] |
| This course will familiarize students with tools for the computational acquisition and analysis of molecular biological data. Key software for gene expression analyses, biological sequence analysis, and data acquisition and management will be presented. Laboratory exercises will guide students through application of relevant tools. |
| <i>Restriction(s):</i> Restricted to students in Bioinformatics programs. Students in other programs may consult with course instructor. |
| <i>Department(s):</i> Dean's Office, College of Biological Science |
| BINF*6410 Bioinformatics Programming F [0.50] |
| This course will introduce bioinformatics students to programming languages. Languages such as C and Perl will be introduced with a focus on bioinformatics applications. The topics covered will serve to aid students when existing software does not satisfy their needs. |
| <i>Restriction(s):</i> Restricted to students in Bioinformatics programs. Students in other programs may consult with course instructor. |
| <i>Department(s):</i> Dean's Office, College of Biological Science |
| BINF*6420 Biosequence Pattern Analysis W [0.50] |
| This course is an overview course on different approaches to analyze biological sequences. Basic concepts are introduced, as well as related algorithms. |
| <i>Restriction(s):</i> Restricted to students in Bioinformatics programs. Students in other programs may consult with course instructor. |
| <i>Department(s):</i> Dean's Office, College of Biological Science |
| BINF*6500 PhD Research Writing in Bioinformatics F,W,S [1.00] |
| Background literature pertinent to the student's initial research direction will be studied. Starting with a reading list provided by the advisor and the instructor, the student will build on this list and construct a major literature review over two semesters. As the student begins to generate initial ideas for their own research direction, their ideas are written and explained. The emphasis will be on a sub-field or sub-fields of bioinformatics and the depth of study will be appropriate to the doctoral level. |
| <i>Restriction(s):</i> Instructor consent required. PhD students in Bioinformatics program |
| <i>Department(s):</i> Dean's Office, College of Biological Science |
| BINF*6890 Topics in Bioinformatics F [0.50] |
| Selected topics in bioinformatics will be covered. The course might focus on biological or informatics topics, or upon a mixture of both. |
| <i>Restriction(s):</i> Restricted to students in Bioinformatics programs. Students in other programs may consult with course instructor. |
| <i>Department(s):</i> Dean's Office, College of Biological Science |
| BINF*6970 Statistical Bioinformatics W [0.50] |
| This course presents a selection of advanced approaches for the statistical analysis of data that arise in bioinformatics, especially genomic data. A central theme to this course is the modelling of complex, often high-dimensional, data structures. |
| <i>Prerequisite(s):</i> Introductory courses in statistics, mathematics and programming |
| <i>Restriction(s):</i> Restricted to students in Bioinformatics programs. Students in other programs may consult with course instructor. |
| <i>Department(s):</i> Dean's Office, College of Biological Science |

BINF*6999 Bioinformatics Master's Project F,W,S [1.00]

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

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

Restriction(s): Restricted to MBNF students only

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

Note

Some courses may not be offered every year. Students planning to take a course from the above list should consult with the Graduate Program Assistant for availability and scheduling.

Electives**Biological Sciences**

| | | |
|-----------|--------|--|
| ANSC*6370 | [0.50] | Quantitative Genetics and Animal Models |
| HHNS*6440 | [0.50] | Nutrition, Gene Expression and Cell Signalling |
| MCB*6370 | [0.50] | Protein Structural Biology and Bioinformatics |
| PLNT*6160 | [0.50] | Advanced Plant Breeding II |
| PLNT*6500 | [0.50] | Applied Bioinformatics |

Computer Science

| | | |
|----------|--------|---|
| CIS*6080 | [0.50] | Genetic Algorithms |
| CIS*6120 | [0.50] | Uncertainty Reasoning in Knowledge Representation |

Mathematics and Statistics

| | | |
|-----------|--------|---|
| STAT*4340 | 0.50 | Statistical Inference |
| STAT*6801 | [0.50] | Statistical Learning |
| STAT*6802 | [0.50] | Generalized Linear Models and Extensions |
| STAT*6950 | [0.50] | Statistical Methods for the Life Sciences |

Note

Some courses may not be offered in every semester. Students planning to take a course from the above list should consult with the department offering the course to check for availability and scheduling.