

## What is it?

This course introduces students to techniques to work with sequence data to answer experimental questions using python based analysis pipelines.

## Instructor

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## Courselink

courselink.uoguelph.ca

## Meetings

Class: 10:00-11:20pm  
M/W

# CIS\*6060

## Bioinformatics -- Winter 2021

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## Land Acknowledgement

The University of Guelph occupies Anishnaabe territory – this is the land of the Missisaugas of the Credit, and, through Treaty No. 3, of the Haudenosaunee peoples. While these words cannot remedy the historical injustices committed here, we recognize, acknowledge and abhor those acts, with a commitment to working for a fairer future.

By joining with the understanding of the ancient Treaty of the Dish with One Spoon tied to this land, we acknowledge, respect, and share the resources around us and the ideas within us. We recognize that the value of our coming together in this place is to work to benefit all, fairly share in the rewards, and with all our hands build a brighter future.

## Caregiving while Learning

This classroom recognizes that caregiving is a community task, and that our classroom community will extend to children and other dependants of classmates. We acknowledge that members of the class may be caring for others, and we support each other in these tasks. We recognize that dependents and other household members of classmates may have needs that must be met during class time, and we recognize that all class members are likely sharing their learning environment with others.

## Course Format

This course will be offered fully online, for the physical safety of all members. We will meet using the online collaboration technology “Zoom.” The CourseLink class website (see sidebar for link) has links for all of our class meetings, as well as a link to a shared Google calendar that you can import into your favourite calendar tool. This calendar will contain meeting links and times.

In the CourseLink site is a “Discussion” forum tool, where questions about the course may be asked and will be answered.

The timeline for course topics is provided in the CourseLink site under the name “Activities by Week.” The document at this site will be updated on a weekly basis as we go through the semester.

One the course is underway, some of the Wednesday sessions will be devoted to practical programming support for those students requiring help. The format of these sessions will be posted in CourseLink once class needs have been assessed.

## Learning Outcomes

Students successfully completing this course will be able to:

- identify, select and use a variety of algorithms for data analysis and pattern extraction;
- critically assess the experimental approach used by authors answering programmatic questions;
- build data analysis pipelines for structured quantitative questions;
- perform statistical analysis of computational results to assess significance;
- collaborating on project design;
- assessing and criticizing peer efforts in a collaborative framework

## Grading Breakdown

<b>Assignments:</b>		30 %
Individual I	Feb 3 (Week 4) : 10 %	
Individual II	Mar 3 (Week 7) : 10 %	
Team Project Assessment	Mar 17 (Week 9) : 10 %	
<b>Individual Project:</b>		35 %
Milestone I (proposal and draft methods)	Mar 10 (Week 8) : 15 %	
Milestone II (final results)	Apr 5 (Week 12) : 20 %	
<b>Presentations:</b>		35 %
Selected Paper	Feb 8 (Week 5) : 10 %	
Peer Feedback	Feb 10 : 5 %	
Project Findings	Apr 5 (Week 12) : 15 %	
Peer Feedback	Apr 7 : 5 %	

Students will work individually on most course work, however students will work in teams containing both computational and scientific expertise in order to assess each other's project proposals.

An additional peer review component of this course will be peer based review of student presentations. Each student will be assigned three other students to provide feedback on their presentation based on a provided rubric. Presentations will be 15 minutes in length maximum, and will be recorded by the presenter. Peer feedback is due two days after the presentation is due.

## Grade Item Chronology

This timeline describes the due dates:

**week 4:** first individual assignment is due

**week 5:** presentation on selected research paper is due (Monday), 3× feedback peer presentations due (Wednesday)

**week 7:** second individual assignment is due

**week 8:** project milestone I (proposal and draft methods) due

**week 9:** team assessment of project proposal due

**week 12:** final deliverables:

- project findings report (Milestone II) and presentation due (Monday)
- 3× review of peer project presentations (Wednesday)

## Deadlines and Submitting Work

All assignments will be submitted electronically through Courselink. **All deadlines fall at the beginning of class** on the day indicated in the case of submitted material. Materials are not accepted after the indicated date and time.

## Inclusion and Accessibility

We are committed to an open and inclusive environment in this course.

Students with accessibility needs are invited to discuss how your needs may best be met with the instructor. This complements any discussion or accommodation presented through Student Accessibility Services ([uoguelph.ca/sas](mailto:uoguelph.ca/sas)).

In particular, anyone who finds barriers to inclusion in the classroom, regardless of the reason, are invited to discuss the situation with the instructor or other teaching staff.

## Pre-Requisites

CIS\*1250, CIS\*1300

## Restrictions

Restricted to BCOMP.SENG majors

## Code of Conduct

Our learning environment must be a friendly, safe and welcoming environment for all, regardless of ethnicity, gender, sexual orientation, age, ability, socioeconomic status, and religion (or lack thereof). As we wish to facilitate and encourage the fullest participation from everyone, this code of conduct outlines the expectations for all participants (including the instructor and other staff).<sup>2</sup> This policy is aligned with the larger *University policy on Non-Academic Misconduct*.

### Expected Behaviour

Participate in an authentic and active way. In doing so, you contribute to the health and value of this community.

Exercise consideration and respect in your speech and actions.

Attempt collaboration before conflict.

Refrain from demeaning, discriminatory, or harassing behaviour and speech.

Be mindful of your surroundings and of your fellow participants.

Alert community leaders (e.g., teaching staff) if you notice a dangerous situation, someone in distress, or violations of this Code of Conduct, even if they seem inconsequential.

### Citizenship and Participation

Communities mirror the societies in which they exist and positive action is essential to counteract the many forms of inequality and abuses of power that exist in society.

If you see someone who is making an extra effort to ensure our community is welcoming, friendly, and encourages all participants to contribute to the fullest extent, we want to know.

### Unacceptable Behaviour

Unacceptable behaviours include: intimidating, harassing, abusive, discriminatory, derogatory or demeaning speech or actions by any participant in our community, either in person, online, at any related events, or in one-on-one communications carried out in the context of community business.

Harassment includes: harmful or prejudicial verbal or written comments related to race, religion, disability, sex, gender, sexual orientation; inappropriate use of nudity and/or sexual images in public spaces (including computer labs and presentation slides); deliberate intimidation, stalking or following; harassing photography or recording; sustained disruption of talks or other events; inappropriate physical contact, and unwelcome sexual attention.

### Consequences of Unacceptable Behaviour

Unacceptable behaviour from any community member, including the course instructor and those members with decision-making authority, will not be tolerated.

**Anyone asked to stop unacceptable behaviour is expected to comply immediately.**

If a community member engages in unacceptable behaviour, action will be taken to ensure that such behaviour ends, beginning with action on the part of the course instructor, and escalating if necessary.

Additional information on University policy regarding harassment, conduct and human rights is available at the [University Human Rights Office](#).

### If You Witness or Are Subject to Unacceptable Behaviour

If you are subject to or witness unacceptable behaviour, or have any other concerns, please notify the course instructor as soon as possible.

If you feel that the course instructor cannot or will not provide remedy for the situation, please

<sup>2</sup>This code of conduct is based upon the citizen code of conduct available via <http://citizencodeofconduct.org/>, and is distributed under a Creative Commons Attribution-ShareAlike license (<http://creativecommons.org/licenses/by-sa/3.0/>)

contact any of these alternate resources:

Associate Director (Undergraduate) <[ugraddir@socs.uoguelph.ca](mailto:ugraddir@socs.uoguelph.ca)>

Director of the School <[director@socs.uoguelph.ca](mailto:director@socs.uoguelph.ca)>

Associate Dean (Academic) <[cpesada@uoguelph.ca](mailto:cpesada@uoguelph.ca)>

Office of Diversity and Human Rights <[dhinfo@uoguelph.ca](mailto:dhinfo@uoguelph.ca)> or extension **53000**

Campus Community Police at extension **52245**

## Academic Misconduct

The University of Guelph is committed to upholding the highest standards of academic integrity and it is the responsibility of all members of the University community – faculty, staff, and students – to be aware of what constitutes academic misconduct and to do as much as possible to prevent academic offences from occurring. 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 need to remain aware that instructors have access to and the right to use electronic and other means of detection.

Please note: Whether or not a student intended to commit academic misconduct is not relevant for 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.

In particular, **it is your responsibility** to accurately and clearly indicate the work of any and all contributing people, including yourself, in all presented and submitted materials. By handing in any work for this (or any) course, unless you have specifically identified any other authorship, **you are claiming that the sole authorship is your own**. Including work from any other person without directly indicating the source of such work constitutes academic fraud of some type.

If you have any questions about what academic fraud such as plagiarism entails, or about any other forms of academic misconduct, please ask your course instructor.

# University Wide Course Outline Information

Winter 2021

## 1 Email Communication

As per university regulations, all students are required to check their e-mail account regularly: e-mail is the official route of communication between the University and its students.

and procedures for course registration are available in their respective Academic Calendars.

- Undergraduate Calendar - Dropping Courses
- Graduate Calendar - Registration Changes
- Associate Diploma Calendar - Dropping Courses

## 2 When You Cannot Meet a Course Requirement

When you find yourself unable to meet an in-course requirement because of illness or compassionate reasons please advise the course instructor (or designated person, such as a teaching assistant) in writing, with your name, id#, and e-mail contact. The grounds for Academic Consideration are detailed in the Undergraduate and Graduate Calendars.

- Undergraduate Calendar - Academic Consideration and Appeals
- Graduate Calendar - Grounds for Academic Consideration
- Associate Diploma Calendar - Academic Consideration, Appeals and Petitions

## 3 Drop Date

Students will have until the last day of classes to drop courses without academic penalty. The deadline to drop two-semester courses will be the last day of classes in the second semester. This applies to all students (undergraduate, graduate and diploma) except for Doctor of Veterinary Medicine and Associate Diploma in Veterinary Technology (conventional and alternative delivery) students. The regulations

## 4 Copies of Out-of-class Assignments

Keep paper and/or other reliable back-up copies of all out-of-class assignments: you may be asked to re-submit work at any time.

## 5 Accessibility

The University promotes the full participation of students who experience disabilities in their academic programs. To that end, the provision of academic accommodation is a shared responsibility between the University and the student.

When accommodations are needed, the student is required to first register with Student Accessibility Services (SAS). Documentation to substantiate the existence of a disability is required; however, interim accommodations may be possible while that process is underway.

Accommodations are available for both permanent and temporary disabilities. It should be noted that common illnesses such as a cold or the flu do not constitute a disability.

Use of the SAS Exam Centre requires students to book their exams at least 7 days in advance and not later than the 40th Class Day.

- For Guelph students, information can be found on the SAS website  
<https://www.uoguelph.ca/sas>
- For Ridgetown students, information can be found on the Ridgetown SAS website

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- Undergraduate Calendar - Academic Misconduct
- Graduate Calendar - Academic Misconduct

## 7 Recording of Materials

Presentations that are made in relation to course work - including lectures - cannot be recorded or copied without the permission of the presenter, whether the instructor, a student, or guest lecturer. Material recorded with permission is restricted to use for that course unless further permission is granted.

## 8 Resources

The Academic Calendars are the source of information about the University of Guelph’s procedures, policies, and regulations that apply to undergraduate, graduate, and diploma programs.

- Academic Calendars  
<https://www.uoguelph.ca/academics/calendars>