
Department of Computer Science, University of Western Ontario

CS9877A/4463A - Course Outline

1. Course Information

Course Information

- CS9877A - Research Topics in Genomics and Proteomics / CS4463A - Computational Biology -- Fall 2026
 - Class time
 - Wednesdays, 4:30 - 6:30pm, [REDACTED]
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List of prerequisites

- CS9877
 - None.
- CS4463
 - Computer Science 3331A/B and Computer Science 3340A/B, or Software Engineering 2205A/B and Software Engineering 3310A/B; Biochemistry 2280A is recommended
 - **OR permission from instructor**

Unless you have either the requisites for this course or written special permission from your Dean's Designate (Department/Program Counsellors and Science Academic Advisors) to enroll in it **or permission from instructor**, you may be removed from this course and it will be deleted from your record. This decision may not be appealed. You will receive no adjustment to your fees in the event that you are dropped from a course for failing to have the necessary prerequisites.

2. Instructor information

- Prof. [Lucian Ilie](#)
 - Office hours: [REDACTED]
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3. Course Syllabus, Schedule, Delivery Mode

Course description

Genomics and proteomics are two rapidly growing areas of molecular biology that are already causing a revolution in medicine. While genomics is concerned with the sequencing and analysis of an organism's genome, proteomics studies the organism's proteome (the entire set of proteins), including protein abundances, variations, modifications, and their interactions with other proteins or DNA. The two fields aim to understand cellular processes and their relation with diseases. The course will provide first an introduction to basic concepts of computational molecular biology, including sequence alignment, dynamic programming, BLAST, spaced seeds,

suffix trees, suffix arrays, Markov chains, hidden Markov models, profile HMMs for sequence families, multiple sequence alignment methods, etc. Then, current and emerging research topics will be discussed, with a focus on machine learning techniques for solving protein prediction problems. Topics include: deep learning, Natural Language Processing, attention, text embeddings such as: word2vec, ELMo, BERT, etc., protein embeddings such as: ProtVec, P_{Ro}BERTa, MSA-transformer, ESM2, ProtBert, ProtAlbert, ProtT5, etc., protein interaction site prediction, protein-protein interaction prediction, protein structure prediction, protein contact map prediction, etc.

4. Course Materials

Useful books (not required)

- W.J. Ewens, G.R. Grant, *Statistical Methods in Bioinformatics*, 2nd edition, Springer, New York, 2005. (CAD 120.61 on amazon.ca)
 - R. Durbin, S. Eddy, A. Krogh, G. Mitchison, *Biological Sequence Analysis*, Cambridge Univ. Press, 1998 (11th printing, 2006). (CAD 92.95 on amazon.ca)
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Lecture Notes

- Click "Lecture notes" button at the top of the page
 - Username and password are given in the Announcements
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OWL

- Students are responsible for checking the course OWL site (<https://westernu.brightspace.com/>) regularly for news and updates. This is the primary method by which information will be disseminated to all students in the class.
 - If students need assistance with the course OWL site, they can seek support on the OWL Brightspace Help page. Alternatively, they can contact the Western Technology Services Helpdesk. They can be contacted by phone at [REDACTED] or [REDACTED].
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5. Methods of Evaluation

Evaluation -- CS9877/CS4463:

- Participation: **20%**
 - Students can miss up to 2 classes without losing participation marks. If they need to miss more classes, permission from the instructor or from their home Faculty Academic Advisors is needed.
 - Presentations (given by each student in class): **80%**
 - [Schedule](#)
 - [Presentation evaluation guidelines](#)
 - There will be no assignments or exams
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6. Additional Statements

6.1 Religious Accommodation

When a recognized religious holiday either requires a student to be absent from the University, or requires or prohibits an activity that makes it impossible for them to complete an academic requirement scheduled that day, they are entitled to accommodation. No student will be penalized for an absence for religious reasons, and an alternative means of satisfying the requirement will be arranged. This accommodation is provided in accordance with the University's policy on Accommodation for Religious Holidays:

https://www.uwo.ca/univsec/pdf/academic_policies/appeals/accommodation_religious.pdf

The student should submit their requests through the Student Absence Portal (SAP), identifying the conflict and the specific course component(s) affected (e.g., test, midterm, exam).

- **Midterms and Tests:** If a religious observance conflicts with a midterm test, they must submit their request no later than one week before the test. Their instructor will arrange an early sitting of the test. As set out above, no makeup test is offered for any other reason; this early sitting is available specifically for this accommodation.
- **Final Examinations:** If a religious observance conflicts with the final exam, the student must submit their request no later than two weeks before the exam. Their instructor will arrange a Special Examination to take place no later than one month after the end of the examination period.

Students are responsible for finding out what was covered in any class they miss due to a religious observance, and for taking the appropriate steps to keep up with the course.

If a suitable arrangement cannot be reached between a student and their instructor, they should consult the Undergraduate Chair of the department offering the course, and if necessary, the Associate Dean (Academic) of the Faculty of Science.

For a list of recognized religious observances, please visit the calendars posted on the Equity, Diversity & Inclusion website - <https://www.edi.uwo.ca> (About Us - Resources - Additional Resources - Calendars).

6.2 Academic Accommodation Policies

Students with disabilities are encouraged to contact Accessible Education, which provides recommendations for accommodation based on medical documentation or psychological and cognitive testing. The policy on Academic Accommodation for Students with Disabilities can be found at:

[https://www.uwo.ca/univsec/pdf/academic_policies/appeals/Academic Accommodation_disabilities.pdf](https://www.uwo.ca/univsec/pdf/academic_policies/appeals/Academic%20Accommodation_disabilities.pdf).

6.3 General Academic Policies

The website for Registrar Services is <https://www.registrar.uwo.ca/>.

Use of @uwo.ca email: In accordance with policy,

https://www.uwo.ca/univsec/pdf/policies_procedures/section1/mapp113.pdf, the centrally administered e-mail account provided to students will be considered the individual's official university email address. It is the responsibility of the account holder to ensure that emails received from the University at their official university address are attended to in a timely manner.

Requests for Relief (formally known as "appeals") Policy on Request for Relief from Academic Decision:

https://uwo.ca/univsec/pdf/academic_policies/appeals/requests_for_relief_from_academic_decisions.pdf

Procedures on Request for Relief from Academic Decision (Undergraduate):

https://uwo.ca/univsec/pdf/academic_policies/appeals/undergrad_requests_for_relief_procedure.pdf

6.4 Scholastic Offences

Policy on Scholastic Offences: https://uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_offences.pdf

Procedures on Scholastic Offences (Undergraduate):

https://uwo.ca/univsec/pdf/academic_policies/appeals/undergrad_scholastic_offence_procedure.pdf

Use of Electronic Devices During Assessments In courses offered by the Faculty of Science, the **possession** of unauthorized electronic devices during any in-person assessment (such as tests, midterms, and final

examinations) is **strictly prohibited**. This includes, but is not limited to: mobile phones, smart watches, smart glasses, hidden cameras and wireless earbuds.

Unless explicitly stated otherwise in advance by the instructor, the presence of any such device at a student's desk, on their person, or within reach during an assessment will be treated as a scholastic offence, **even if the device is not in use**.

Effective September 2026, **the typical penalty for this offence is a failing grade in the course AND a 12-month prohibition on retaking the course**. Only devices expressly permitted by the instructor (e.g., non-programmable calculators) may be brought into the assessment room. It is their responsibility to review and comply with these expectations.

Use of Generative AI Tools Unless otherwise stated, the use of generative AI tools (e.g., ChatGPT, Microsoft Copilot, Google Gemini, or similar platforms) is **not permitted** in the completion of any course assessments, including but not limited to: assignments, lab reports, presentations, tests, and final examinations.

Using such tools for content generation, code writing, problem solving, translation, or summarization--when not explicitly allowed--will be treated as a **scholastic offence**.

If the use of generative AI is permitted for a particular assessment, the conditions of use will be specified by the instructor in advance. If no such permission is granted, students must assume that use is prohibited. It is the student's responsibility to seek clarification before using any AI tools in academic work.

6.5 Support Services

Academic Advising. Please visit the Science & Basic Medical Sciences Academic Advising webpage for information on adding/dropping courses, academic considerations for absences, requests for relief, exam conflicts, and many other academic-related matters: <https://www.uwo.ca/sci/advising/>.

Mental Health Support. Students who are in emotional/mental distress should refer to Mental Health@Western (<https://uwo.ca/health/>) for a complete list of options about how to obtain help.

Gender-Based and Sexual Violence. Western is committed to reducing incidents of gender-based and sexual violence (GBSV) and providing compassionate support to anyone who has gone through these traumatic events. If a student has experienced GBSV (either recently or in the past), they can find information about support services for survivors, including emergency contacts, at:

https://www.uwo.ca/health/student_support/survivor_support/get-help.html.

To connect with a case manager or set up an appointment, please contact [REDACTED].

Accessibility for Coursework. A student may contact the course instructor if they require lecture or printed material in an alternate format or if any other arrangements can make this course more accessible to them. If they have any questions regarding accommodations, they may also contact Accessible Education at http://academicsupport.uwo.ca/accessible_education/index.html

Learning Development and Success. Learning-skills counsellors at Learning Development and Success (<https://learning.uwo.ca>) are ready to help students improve their learning skills. The facility offers strategies for improving time management, multiple-choice exam preparation/writing, textbook reading, and more. Individual support is offered throughout the Fall/Winter terms in the drop-in Learning Help Centre, and year-round through individual counselling.

Student Councils. Student-run support services are offered by the University Students' Council (<https://westernusc.ca>) and the Science Students' Council (<https://www.westernssc.ca>).
