

Math 2155F, Fall 2023

- **Instructor:** Ajneet Dhillon
- **Email:** adhill3@uwo.ca
- **Office:** MC 103F
- **Office Hours:** See owl site
- **Class times:** MWF 10:30-11:30
- **Prerequisites:** 1.0 course from: Mathematics 1120A/B, Mathematics 1600A/B, Numerical and Mathematical Methods 1412A/B, Numerical and Mathematical Methods 1414A/B, Calculus 1000A/B, Calculus 1500A/B, Calculus 1301A/B, Calculus 1501A/B, the former Applied Mathematics 1412A/B, the former Applied Mathematics 1414A/B, the former Applied Mathematics 1413, in each case with a minimum mark of 60%; or permission of the department. Integrated Science 1001X with a minimum mark of 60% can be used in place of Calculus 1301A/B.
- **Antirequisites:** Mathematics 2151A/B, the former Mathematics 2155A/B.
- **Web page:** this page and [OWL](#).

Students are responsible for checking the course OWL site (<http://owl.uwo.ca>) on a regular basis for news and updates. This is the primary method by which information will be disseminated to all students in the class.

Course Syllabus

This course provides an introduction to logical reasoning and proofs. Topics include sets, mathematical induction, relations and functions, partial order relations, equivalence relations, binary operations, elementary number theory, and applications to error correcting codes. The course is an essay course and will focus on teaching students to write clear, correct proofs in full English sentences in a style that is readable to others. The first part of the course will teach the necessary background in logic, and will use short-answer evaluation

Essay Requirements

This is an essay course. You will be required to write clear, logical proofs in full English sentences. You will be marked on the clarity and correctness of what you write. Such questions will appear on the midterm, final and the homework sets (after the first four weeks).

Key Sessional Dates

- Classes begin: September 7
- Fall Reading Week: October 30 – November 5, 2023
- Classes end: December 8, 2023
- Exam period: December 10 – 22, 2023

Contingency Plan

Although the intent is for this course to be delivered in person, should any university-declared emergency require some or all of the course to be delivered online, either synchronously or asynchronously, the course will adapt accordingly. The grading scheme will **not** change. Any assessments affected will be conducted online as determined by the course instructor.

Textbook

The text book for the course is *How to Prove It*, third edition, by Daniel J. Velleman, Cambridge University Press. It is required that you have access to this edition of the book.

Evaluation

Homework 25%, midterm 35%, final exam 40%. The homework sets will be weighted by how many marks they are out of. There will be approximately 10 homework sets due approximately once per week. One homework score will be dropped from your final course score.

Learning Outcomes

- Students should be able to write down clear and logically valid proofs to mathematical statements.
- Students should be able to understand and implement standard proof strategies such as induction, use of quantifiers and proof by contradiction.
- Provide counterexamples to false statements.
- Implement the proof strategies and provide counterexamples as above to verify the veracity of elementary statements in number theory and public key cryptography.

Cheating

Homework assignments are to be completed independently without outside help and help from peers. Students who are found to be in violation of this will receive a deduction of 5 course marks from their final course score.

No electronic aids may be used on the midterm or final exam. This includes, but is not limited to, computers, tablets, calculators, phones and laptops. Students who violate this will be reported to the Dean's office and a suitable penalty will be determined.

Student Absences

If you are unable to attend the midterm exam due to illness or other serious circumstances, please contact academic counselling in your faculty of registration as soon as possible.

For further information, please consult the University's medical illness policy at

[Academic Consideration](#)

The student medical certificate is available [here](#).

Absences from Final Examinations

If you miss the Final Exam, please contact the Academic Counselling office of your Faculty of Registration as soon as you are able to do so. They will assess your eligibility to write the Special Examination (the name given by the University to a makeup Final Exam)

You may also be eligible to write the Special Exam if you are in a "Multiple Exam Situation" (e.g., more than 2 exams in 23-hour period, more than 3 exams in a 47-hour period)

If a student fails to write a scheduled Special Examination, the date of the next Special Examination (if granted) normally will be the scheduled date for the final exam the next time this course is offered. The maximum course load for that term will be reduced by the credit of the course(s) for which the final examination has been deferred. See the Academic Calendar for details (under Special Examinations).

Missed homework

Note that one homework score will be dropped from your final score calculation. If you miss a homework due to an illness or some other circumstance, this will be the homework that is dropped from your final score

calculation. If you miss multiple homework sets and have a valid reason for doing so you should contact the instructor.

Missed Midterm

If you are unable to attend the midterm exam due to illness or other serious circumstances, please contact academic counselling in your faculty of registration as soon as possible. There will be a makeup midterm scheduled approximately one week after the regular midterm exam. If you miss the makeup midterm, the weight of the exam will be shifted to the final exam.

Accommodation and Accessibility

Religious Accommodation

When a course requirement conflicts with a religious holiday that requires an absence from the University or prohibits certain activities, students should request accommodation for their absence in writing at least two weeks prior to the holiday to the course instructor and/or the Academic Counselling office of their Faculty of Registration. Please consult University's list of recognized religious holidays (updated annually) at

[Religious Holidays](#)

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:

[Accommodation for students with disabilities.](#)

Academic Policies

The website for Registrarial Services is www.registrar.uwo.ca

In accordance with [policy](#), the centrally administered e-mail account provided to students will be considered the individual's official university e-mail address. It is the responsibility of the account holder to ensure that e-mail received from the University at their official university address is attended to in a timely manner.

No electronic aids may be used on the midterm or final exam. This includes, but is not limited to, computers, tablets, calculators, phones and laptops. Students who violate this will be reported to the Dean's office and a suitable penalty will be determined.

Scholastic offences are taken seriously and students are directed to [read the appropriate policy](#).

Support Services

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

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.

Western is committed to reducing incidents of gender-based and sexual violence and providing compassionate support to anyone who has gone through these traumatic events. If you have experienced sexual or gender-based violence (either recently or in the past), you will 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 support@uwo.ca.

Please contact the course instructor if you require lecture or printed material in an alternate format or if any other arrangements can make this course more accessible to you. You may also wish to contact Accessible Education at http://academicsupport.uwo.ca/accessible_education/index.html if you have any questions regarding accommodations.

Learning-skills counsellors at the Student Development Centre (<https://learning.uwo.ca>) are ready to help you improve your learning skills. They offer presentations on 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.

Western University is committed to a thriving campus as we deliver our courses in the mixed model of both virtual and face-to-face formats. We encourage you to check out the Digital Student Experience website to manage your academics and well-being: <https://www.uwo.ca/se/digital/>.

Additional student-run support services are offered by the USC, <https://westernusc.ca/services/>.