

Mathematical Structures, Math 2155F, Fall 2022

Students are responsible for checking **this web page** and the [course OWL](#) site on a **regular basis** for news and updates. Announcements will also be sent to your UWO email address using OWL.

Course outline: This course provides an introduction to logical reasoning and proofs. Topics include sets, relations and functions, partial order relations, equivalence relations, mathematical induction, and elementary number theory.

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.

- **Instructor:** Dan Christensen
- **E-mail:** jdc@uwo.ca
- **Office:** Middlesex 130.
- **Office Phone:** 519-661-2111 x86530.
- **Office Hours:** See OWL site.
- **Class times and location:** MWF 10:30-11:20, [NS-7](#), starting September 9 and ending on December 7.
- **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](#).
- **Forum:** [OWL forum](#).

Text (required): The text book for the course is *How to Prove It*, third edition, by Daniel J. Velleman, Cambridge University Press. Hard copies and electronic copies are available from the [UWO bookstore](#) in person or online (they ship) and from [Amazon](#). The book is also available as an [Adobe eBook](#) from the publisher.

We will cover most of chapters 1 through 6, and some of chapter 7. The textbook is a valuable resource that gives more examples and details than can be given during lecture. Students are expected to **read the text book, going over what we have covered, reading ahead to what comes next, and studying additional examples.**

Homework: Homework will be due roughly once per week, usually on Fridays at 11:59pm, starting Friday, September 16. We will use WeBWork for short answer homework early in the course and GradeScope for long answer homework later in the course. While I encourage you to discuss the course material with classmates, homework must be done **independently**. You may not get solutions from other students or search for solutions

online or from other sources. Your solutions should be **clear** and **carefully written**. Homework will be graded based on both correctness and clarity. Late problem sets will not be accepted unless arranged in advance for a good reason.

Midterms: There will be one midterm, date TBA.

Final exam: There will be a 3-hour final exam that will be scheduled by the registrar during the final exam period.

No calculators, books, notes or other aids may be used during the midterm and final exam.

Evaluation: homework 25%, midterm 35%, final exam 40%. The homework sets will be weighted by how many marks they are out of. When calculating the final grade, **one homework set will be dropped** from the calculation.

Scholastic offences: Scholastic offences are taken seriously and students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence, at [this web site](#).

Scholastic offences include: Copying solutions from other students, online sources, textbooks, etc.; showing your work to other students; uploading questions or solutions to a web site; and accessing a web site used for providing solutions (even if you do not use any solutions on the site). The **penalty** for an academic offence involving a midterm or final will be a **failing grade in the course**. The **penalty** for each academic offence involving homework will be a grade of 0 on the homework set as well as a penalty of **negative 5% on the overall course grade**. In some cases, the penalty can include expulsion from the program. All academic offences are added to your student record.

Online access required: We will be using WeBWork and GradeScope for homework and exams. By taking this course, you are consenting to the use of this software. Completion of this course will require you to have a reliable internet connection and a device that meets the technical requirements for these services.

Contingency plan for an in-person class pivoting to 100% online learning: In the event of a COVID-19 resurgence during the course that necessitates the course delivery moving away from face-to-face interaction, affected course content will be delivered entirely online, either synchronously (i.e., at the times indicated in the timetable) or asynchronously (e.g., posted on OWL for students to view at their convenience). The grading scheme will **not** change. Any remaining assessments will also be conducted online as determined by the course instructor.

In the event of a health lockdown, tests and examinations in this course will be conducted using a remote proctoring service. By taking this course, you are consenting to the use of this software and acknowledge that you will be required to provide personal information (including some biometric data) and the session will be recorded. Completion of this course will require you to have a reliable internet connection and a device that meets the technical requirements for this service. More information about this remote proctoring service, including technical requirements, is available at: [Western's Remote Proctoring website](#).

Late arrivals: If you are unable to arrive in Canada at the start of the term, you are still responsible for completing all homework on time. (It will all be submitted electronically.) It

is your responsibility to read this web page and the OWL page frequently to be aware of all deadlines. The lectures this term will *not* be recorded, but you can ask for notes from other students and/or watch the recorded lectures from Fall 2020 (link available in OWL). Of course, all comments from Fall 2020 about deadlines, remote proctoring, etc, do not apply to the current term.

UWO e-mail: In accordance with [this 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 his/her official university address is attended to in a timely manner.

Eligibility: You are responsible for ensuring that you have successfully completed all course prerequisites and that you have not taken an antirequisite course. Unless you have either the requisites for this course or written special permission from your Dean to enroll in it, 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.

Student Absences

Academic Consideration for Student Absences: Students who experience an extenuating circumstance (illness, injury or other extenuating circumstance) sufficiently significant to temporarily render them unable to meet academic requirements must provide valid medical or supporting documentation to the Academic Counselling Office of their Faculty of Registration as soon as possible. For further information, please consult the University's medical illness policy at [this link](#). For medical absences, you must submit a [Student Medical Certificate \(SMC\)](#) signed by a licensed medical or mental health practitioner.

This policy applies to homework, the midterm, and the final. Note that one homework set will always be dropped when computing the final grade.

In all cases, students are required to contact their instructors within 24 hours of the end of the period covered.

Students should also note that individual instructors are not permitted to receive documentation directly from a student, whether in support of an application for consideration on medical grounds, or for other reasons. **All documentation required for absences must be submitted to the Academic Counselling office of a student's Home Faculty.**

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) in the [Western Multicultural Calendar](#).

Course policy on excused absences: If a student has permission to miss a homework set, no make-up will be given. Instead, that component will be **reweighted** to the final exam. If a student has permission to miss the midterm or final, there will be a **make-up exam** on a

specified date. A student unable to write the make-up for the midterm will have the midterm reweighted to the final exam.

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).

Accommodation Policies: Students with disabilities work with 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 [this link](#).

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](#) if you have any questions regarding accommodations.

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.

The website for Registrarial Services is <http://www.registrar.uwo.ca>.

Learning-skills counsellors at [Learning Development & Success](#) 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.

Students who are in emotional/mental distress should refer to [Mental Health@Western](#) 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 [this link](#). To connect with a case manager or set up an appointment, please contact support@uwo.ca.

Additional student-run support services are offered by the [USC](#).