

# Mathematical Structures, Math 2155F, Fall 2020

**Course outline:** 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.

- **Instructor:** Dan Christensen
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- **Office:** Middlesex 130.
- **Office Phone:** 519-661-2111 x86530.
- **Office Hours:** Mondays 1:00-1:50pm, Thursdays 10:00-10:50am, via same Zoom link as lectures (see OWL).
- **Class times and location:** MWF **10:30-11:20**, NCB-101, starting September 9 and ending on December 9. **Note that time is back to the regular time!**
- **Prerequisites:** 1.0 course from: Mathematics 1120A/B, Mathematics 1600A/B, Applied Mathematics 1413, Calculus 1000A/B, Calculus 1500A/B, Calculus 1301A/B, Calculus 1501A/B, in each case with a minimum mark of 60%; or permission of the department.
- **Antirequisites:** Mathematics 2151A/B, the former Mathematics 2155A/B.
- **Web page:** [OWL](#).

**In-person/online:** **Lectures are now online only.** The **Zoom link** is available via the [OWL](#) site. Lectures will also be recorded and made available for watching asynchronously.

**Text (required):** The text book for the course is *How to Prove It*, third edition, by Daniel J. Velleman, Cambridge University Press. Hard copies are available from the UWO bookstore web site (they ship) and [Amazon](#). Amazon also sells it in Kindle format, which can be read on all devices and computers. The book is also available as an [Adobe eBook](#) from the publisher.

We will cover chapters 1 through 6, and maybe more if there is time. 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. 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 two midterms. The first midterm is on **Tuesday, October 13, 7-10pm**. The second midterm is **Thursday, November 19, 7-10pm**. Midterm 1 will use WeBWorK and Midterm 2 will use GradeScope. Midterm 1 will use Proctortrack, but I am not sure about Midterm 2. The midterms will be 2-hour tests, but students will be given three hours, to allow for technical issues.

**Final exam:** There will be a 3-hour final exam that will be scheduled by the registrar during the final exam period: **December 21, 9am-1pm**. Students will be given four hours, to allow for technical issues.

No calculators or web sites can be used during the midterms and final exam. The text book and course lecture notes may be used.

**Evaluation:** homework 30%, midterm 1 20%, midterm 2 20%, and final exam 30%. The homework sets will be weighted by how many marks they are out of.

**Accommodation Policies:** Students with disabilities work with Accessible Education (formerly SSD) which provides recommendations for accommodation based on medical documentation or psychological and cognitive testing. The Academic Accommodation for Students with Disabilities policy can be found at [this link](#).

The tests for this course will be set up so that all students have an **extra hour**. If you require **additional** accommodation, please contact the instructor to make arrangements.

**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](#).

**Copying solutions** from other students, online sources, textbooks, etc., or showing your work to other students constitutes a scholastic offense and will result in a grade of **negative 100%** for the component and in some cases expulsion from the program. All academic offenses are added to your student record.

**Proctortrack:** Tests and examinations in this course will be conducted using a remote proctoring service, such as Proctortrack. We will also be using WeBWork and GradeScope for homework and exams. 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 that the session will be recorded. More information about this remote proctoring service is available in the Online Proctoring Guidelines at [this link](#).

Completion of this course will require you to have a reliable internet connection and a device that meets the technical requirements for these services. Information about the technical requirements for Proctortrack are available at [this link](#).

All students will be required to do a Proctortrack **onboarding quiz** before the first midterm. If this is not done, then the student will not receive accommodation for technical problems during the exams.

**Lectures recorded:** All of the remote learning sessions for this course will be recorded. The data captured during these recordings may include your image, voice recordings, chat logs and personal identifiers (name displayed on the screen). The recordings will be used for educational purposes related to this course, including evaluations. The recordings may be disclosed to other individuals participating in the course for their private or group study purposes. Please contact the instructor if you have any concerns related to session recordings.

Participants in this course are not permitted to record the sessions, except where recording is an approved accommodation, or the participant has the prior written permission of the instructor.

**UWO e-mail:** 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.

**Academic Consideration for Student Absence:** Students will have up to two (2) opportunities during the regular academic year to use an on-line portal to self-report an absence during the semester, provided the following conditions are met: the absence is no more than 48 hours in duration, and the assessment for which consideration is being sought is worth 30% or less of the student's final grade. Students are expected to contact their instructors within 24 hours of the end of the period of the self-reported absence. Students are not able to use the self-reporting option in the following circumstances:

- for exams scheduled by the Office of the Registrar (e.g., December and April exams)
- absence of a duration greater than 48 hours,
- assessments worth more than 30% of the student's final grade,
- if a student has already used the self-reporting portal twice during the academic year

If the conditions for a Self-Reported Absence are not met, students will need to provide a Student Medical Certificate if the absence is medical, or provide appropriate documentation if there are compassionate grounds for the absence in question. Students are encouraged to contact their Faculty academic counselling office to obtain more information about the relevant documentation.

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 that are not covered by the Self-Reported Absence Policy must be submitted to the Academic Counselling office of a student's Home Faculty.

For policy on Academic Consideration for Student Absences - Undergraduate Students in First Entry Programs, see [this link](#) and for the Student Medical Certificate (SMC), see [this link](#).

Students should consult the University's list of recognized **religious holidays**, and should give reasonable notice in writing, prior to the holiday, to the Instructor and an Academic Counsellor if their course requirements will be affected by a religious observance. Additional information is given in the [Western Multicultural Calendar](#).

You may also be eligible to write the Special Exam if you are in a **Multiple Exam Situation** (see [this link](#)).

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 Academic Calendar for details (under Special Examinations).

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

**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.

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 Student Accessibility Services (SAS) at (519) 661-2147 if you have any questions regarding accommodations.

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.

Learning-skills counsellors at the [Student Development Centre](#) 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.

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

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