Math 250Q   Spring 2020

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Office hours: To be announced on Canvas

Textbooks:

D. Velleman, *How to Prove It.*


Handouts and excerpts from other texts will be used.

Course Content: Mathematics 250 is a survey of basic mathematics with a focus on proving. The course will cover elements of the propositional calculus, the predicate calculus, and techniques of proof (including mathematical induction); sets and the set-theoretical development of basic mathematical objects (relations, functions, operations); and brief introductions to the fields of combinatorics, number theory, group theory, and analysis.

Course Goals: The overall goal is to prepare the student for higher mathematics as well as possible in a semester.

At the end of the course, the student should achieve the following process goals: to read and apply a complicated definition; to produce an example of a thing defined; to read and understand proofs; to understand what needs to be proved in a statement; to apply various strategies for proving a statement; to create simple proofs; to write a proof cogently. And the student should achieve the following content goals: to understand the propositional and predicate calculi; to know the basic definitions in the fields of set theory, number theory, group theory, and analysis.

Attendance/Class Participation: Students are expected to attend all classes and are responsible for all materials covered in class as well as any changes made in the schedule.

The course is student-centered and inquiry-driven. Before class, students are expected to study assigned materials, take notes and try to understand most of the basic definitions, examples and concepts. Sometimes a pre-lecture quiz will be given to evaluate how well a student is prepared for class. Students are expected to bring to class a list of questions and thoughts relevant to the topics to be discussed.

Students should actively participate in class-discussions. Being absent, late, inattentive or inactive will lead to deductions to one’s class participation grade. Attendance and consistent preparation for class will determine the success or failure the student realizes in this course.

Quizzes. Both announced and unannounced quizzes will be given. Some are meant to check how well a student is prepared for class (see above), others are to check one’s understanding after a topic has been discussed. When appropriate, some quizzes will be done in groups. A student must be present to take the quizzes. No make-up quizzes will be given.

Coursework: Problems will be assigned and collected for credit. To receive full credit the work
must be correct, well-written, and **done alone**; the student will have the opportunity to revise their work until it is correct and well-written before the deadlines (deadlines will be assigned to each problem). Problems and revisions are **due each Monday**. The problems are the major component of the course. Students may not always receive the same problems.

Homework exercises will be assigned. These are for the benefit of the student. Sometimes the student will have to prepare a proof for presentation in class.

**Examinations:** Two midterm examinations will be given in class. Details will be announced later. Students are expected to take tests at the scheduled times. For legitimate reasons and conflicts students may take the tests prior to the scheduled time. Any emergencies will be handled on an individual basis and must be documented. **No make-up test will be given after the testing time**

**Final Exam:** A cumulative final examination will be given at the time scheduled by the Registrar.

**Grading:** Grades will be based on the problems collected for credit (40%), the final examination (20%), two midterm examinations (20%), quizzes (10%) and class participation (10%). These percentages are approximate. Each student’s work will be judged in relation to the goals set for the course.

**Written Work:** Thoughts are expressed by sentences. *Your written work must be in complete sentences.* Use mathematical symbols wherever appropriate. Pay attention to how the problems are worked out in the textbook. Your work should be neat and legible. It is common practice to rewrite solutions once they are found.

**Calculators:** In general, calculators will **not** be allowed unless the opposite is announced.

**Support Services:** Students should utilize the following resources:

- **Office Hours:** Office hours will be posted on Canvas. Students should use this time to ask specific questions related to this course and/or homework problems.
- **Canvas Site:** There will be a Canvas course site. Documents and announcements related to the course will be posted there. This includes topics covered that day, homework assignments, suggestions on studying the textbook, topics to preview before next lecture and other announcements. Students should check the site at least once a day.
- **Help Sessions:** Out-of-class review sessions may be scheduled as needed.
- **Study Groups:** Study groups organized by students are highly recommended. The meetings should be scheduled weekly and should be part of a regular weekly routine.

**HONOR CODE:** THE HONOR CODE OF OXFORD COLLEGE APPLIES TO ALL WORK SUBMITTED FOR CREDIT. ALL SUCH WORK WILL BE PLEDGED TO BE YOURS AND YOURS ALONE. THIS IS THE CASE WHEN YOU PLACE YOUR NAME ON WORK SUBMITTED. THIS IS PARTICULARLY IMPORTANT FOR THE PROBLEM SETS: THE ONLY PERMITTED REFERENCES ARE LISTED ON THIS SYLLABUS UNDER TEXTBOOKS (INCLUDING THE HANDOUTS AND EXCERPTS). IN PARTICULAR, NO INTERNET RESOURCES ARE PERMITTED. ONE MAY NOT DISCUSS THE PROBLEMS WITH ANYONE EXCEPT THE INSTRUCTOR.