

# Math 310W: Foundations For Higher Mathematics

## Spring 2020

**Instructor:** Martha Precup

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**Lecture:** MWF 3-3:50pm in Somers Family Hall, Room 249

**Textbook:** *A Concise Introduction to Pure Mathematics*, by Martin Leibeck

**Overview:** This course is an introduction to mathematical reasoning and proof. It is designed to teach you to think logically and rigorously. A large component of this course is communication—conveying your ideas and proofs clearly both verbally and in writing.

### Other Resources:

- *Book of Proof*, by Richard Hammack,  
<http://www.people.vcu.edu/~rhammack/BookOfProof/BookOfProof.pdf>
- *Transition to Higher Mathematics: Structure and Proof*, by Bob A. Dumas and John E. McCarthy, <https://openscholarship.wustl.edu/books/10/>

**Homework:** Completing written assignments plays a key role in learning the material. Your homework will consist of writing up complete and correct proofs of each assigned problem. Over the course of the semester you will create a portfolio of written proofs, and assignments are designed to introduce you to various proof techniques using material we learn in class. Problems will be posted on Canvas and you will submit your solutions through Crowdmark every Tuesday. **Late or illegible homework will not be not accepted.**

You are encouraged to work with others, but you must write up solutions individually. If your proof is based on an idea you read or heard about from someone else, a textbook, or an on-line resource then **you must cite your sources**. You are allowed to use any resources to solve the homework provided you cite them properly. Citations are worth one point for each HW problem. TeX is the standard system for typesetting mathematics, and **you are required to prepare each assignment using TeX**. I will post resources on Canvas to help you get started.

**Presentations:** Each student will give one 10-15 min presentation in class this semester. Your presentation grade will be weighted equally between your: proof, written presentation, and oral presentation. As part of your presentation, you will write a 1-2 page paper. This document should be a short self-contained set of notes which includes the proof you are presenting as well as all relevant definitions and examples.

**Exams:** There will be two in-class exams, one on **Wednesday, February 19** and one on **Wednesday, March 25**. The final exam will take place on **Thursday, April 30** at 6pm-8pm. If you miss one midterm exam for some reason, the missed exam grade will be replaced with your final exam grade.

**Final Paper:** This semester you will write a 4-5 page paper on a mathematical concept that interests you. This project will include at least one revision. More information about this assignment will be posted on Canvas. **The final paper is due in class on Friday, April 24.**

**Grading:** Grading of all assignments is based on content and form. Your work must demonstrate your mastery of the mathematical topics and be clearly expressed. **Your lowest midterm exam score will be replaced with your in-class final exam score if this increases your grade, and your two lowest homework scores will be dropped.** The lower bounds for letter grades are *at least* as generous as the standard grading scale. Final grades are weighted by:

Homework	20 %
Presentation	10 %
Exam 1	15 %
Exam 2	15 %
Final Exam	20 %
Final Paper	20 %

**Preparing written assignments:**

- **Both content and form count in grading.** Write in complete sentences. Make use of all relevant mathematical terms and use proper mathematical grammar.
- Your writing should be clear and concise.
- Any regrade requests must be made within a week of the assignment being returned.
- Any work submitted under your name is expected to be your own. **Be sure to document all ideas that are not your own.**

**Preparing for class presentations:**

- A presentation takes time to prepare – do not leave it for the last minute!
- Make an appointment to practice before giving your presentation to the class, and bring a draft of your 1-2 page presentation paper with you for feedback.
- The purpose of the presentation is to make the ideas of the proof clear to other students. Lecture to the students, not to the professor.
- Write out the proof in detail. Understand what the key ideas are.
- Use proper grammar and mathematical notation.
- Explain your reasoning as you go along. Do not write everything down and then start explaining.
- Engage the audience and leave time for questions.

**Academic Integrity:** Students must comply with Washington University regulations regarding academic integrity. For more information, see: <https://wustl.edu/about/compliance-policies/academic-policies/undergraduate-student-academic-integrity-policy/>. Plagiarism is a form of cheating or fraud; it occurs when a student misrepresents the work of another as their own.

**Disability Resources (DR):** Special accommodations for exams are offered to students who have registered in a timely manner at Disability Resources (DR), preferably within the first two weeks for class. More information about DR may be found at: <http://disability.wustl.edu>