

# Math 310W: Foundations for Higher Mathematics

## Spring 2021

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### Meetings

Tuesdays and Thursdays  
10-11:15am

### Instructor

Prof. Laura Escobar

### Email

laurae@wustl.edu

### Course 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. Topics include basic logic, set theory, methods of proof and counterexamples, foundations of mathematics, counting methods, and combinatorial arguments.

### Required Text

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

### Course Website and Communication

### Office Hours

Tuesdays and Wednesdays  
3-3:55pm

\*Subject to change\*

All course materials, Zoom links, announcements, and related communications will be posted on the course's Canvas page. You should check Canvas regularly. Canvas announcements will be the primary way that I communicate with you and send important information; you should make sure that you receive them by email or otherwise check them daily.

### Grading

Your numerical grade will be a combination of:

1. Homework (25%)
2. A writing assignment (20%), due May 4, with a short proposal due March 11
3. Two midterms (10% + 10%) on February 23 and March 25
4. A final exam (25%) due Wednesday May 12 at 8pm
5. Attendance and participation (10%)

Your final letter grade will be computed from your numerical grade as follows:

|     |        |       |       |       |       |       |       |       |         |      |
|-----|--------|-------|-------|-------|-------|-------|-------|-------|---------|------|
| A+  | A      | A-    | B+    | B     | B-    | C+    | C     | C-    | D+/D/D- | F    |
| TBD | 90-100 | 85-90 | 80-85 | 75-80 | 70-75 | 65-70 | 60-65 | 55-60 | 50-55   | 0-50 |

## Course Format and Attendance Policy

- Each week, I will post about 30 minutes of prerecorded lecture videos. You will have time to watch them during the scheduled lecture time.
- Attendance is expected for all sessions at the appointed class time and will be tracked. All email about attendance will be deleted and not answered.
- Four absences will be allowed without penalty. The 5th absence will incur a 2% deduction from your course grade in the participation category. The 6th and 7th absences will each incur a 4% course grade deduction. The 8th absence will result in an automatic F on the course.

## Study/Wellness days

The following dates are either Study days in the Mathematics and Statistics Department, or Wellness Days in Arts and Sciences:

Tuesday Feb 9

Tuesday Mar 2

Wednesday Mar 3

Monday Mar 22

Monday April 12

On these days, there are no office hours or classes.

## Homework Policy

Due on most Thursdays and a few Tuesdays. Problems will be posted on Canvas and you will submit your solutions through Crowdmark. Late or illegible homework will not be accepted. Your  $\lfloor N/5 \rfloor$  lowest homework scores will be dropped, where  $N$  is the total number of homework assignments. (For example, if there are a total of 14 homework assignments, your lowest score on  $\lfloor 14/5 \rfloor = \lfloor 2.8 \rfloor = 2$  will be dropped.)

You are highly encouraged to work with others, but you must write up solutions individually and in your own words. 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.

## Writing Assignment

You will write a 4-5-page paper on a mathematical topic that interests you. Your paper will demonstrate that you have thought deeply about the subject, and you have worked hard to make it accessible to the reader. Your target

audience will be either your fellow MATH 310W classmates or the general public. This project will include one revision. The final paper is due in class on Tuesday, May 4.

### **Final Exam**

The final exam, due Wednesday May 12 at 8pm, will consist of three parts: a few proof questions, a math journal, and a summary of the course. You will work on the math journal portion of the final throughout the semester. By the beginning of each lecture, you will turn in the most up to date version of your journal through Canvas. Each entry will discuss the material of the preceding lecture and it will be graded on completeness only. Four missed entries to the journal will be allowed without penalty. The 5th missed entry will incur a 2% deduction from your course grade in the final exam category. The 6th and 7th missed entries will each incur a 4% course grade deduction. The 8th missed entry will result in an automatic F for the course.

### **Academic Integrity**

Academic integrity refers to the “integral” quality of the search for knowledge that a student undertakes. The work a student produces, therefore, ought to be wholly hers or his; it should result completely from the student’s own efforts. Plagiarism is a form of cheating or fraud; it occurs when a student misrepresents the work of another as his or her own. Plagiarism may consist of using the ideas, sentences, paragraphs, or the whole text of another without appropriate acknowledgment, but it also includes employing or allowing another person to write or substantially alter work that a student then submits as her or his own.

You must comply with WUSTL’s regulations regarding academic integrity. For more information, see: <https://wustl.edu/about/compliance-policies/academic-policies/undergraduate-student-academic-integrity-policy/>. Penalties for cheating and plagiarism range from an F on a particular assignment, through an F for the course, to expulsion from the university.

### **Disability Resources (DR)**

If you need accommodations for a disability, please contact Disability Resources and forward your accommodation letter to Prof. Escobar, once approved.