MATH 3283W
Sequences, series, and foundations
Spring 2020
4 credits

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Course website: http://www.math.umn.edu/∼spirn/3283w
Lecture: MWF 9:05-9:55, Fraser 101
Office hours: MW 10-11, Th 9-10
TAs: Claire Frechette, Emily Gullerud, Andy Hardt, Zane Huttinga, Michelle Pinharry, Jorin Schug.
TAs' office hours are listed on the course website.

Welcome!

This course is a transition from introductory calculus to upper-division mathematics. That transition can be a challenge for many students, both because the mathematics is more abstract, and because the personal study time required to succeed in the course can be greater than in previous courses. **We want you to succeed!** Come talk to us. We welcome *everyone* to the community of mathematicians.

Prerequisites and programs

The prerequisites are Calculus I and II and the two sophomore courses Linear Algebra/Differential Equations and Multivariable Calculus, or completion of one sophomore course with concurrent registration in the other.

MATH 3283W is part of the BA and BS Mathematics major programs and the Mathematics minor program, and serves as a technical elective for several other major programs.

Required text

Lay, *Analysis: With an Introduction to Proof*, 5th ed., Pearson. It is blue.
The core material of the course corresponds to sections 1.1-1.4, 2.1-2.4, 3.1-3.4, 4.1-4.4, 8.1-8.3, 5.1-5.2. A tentative schedule of textbook sections covered during each lecture time appears at the end of this document.

Reading the textbook sections in advance is essential for success in the course and in engaging in the lecture and discussion periods.

Goals for the course

To develop skills in mathematical communication: oral, written, and typeset. To develop critical thinking skills. To introduce and practice techniques of mathematical proof. To develop rigorously the analysis of sequences and series, as a transition from introductory calculus to higher mathematics.

Student learning outcomes

This course aims to address, at the least, the following student learning outcomes: students will identify, define, and solve problems; locate and critically evaluate information; master a body of knowledge and a mode of inquiry; and communicate effectively.

Grading

15%	Six writing quizzes
5%	Five writing explorations
5%	Oral presentation
5%	TEX project
45%	Three fifty-minute exams, during Thursday discussions: 13 February, 19 March, 16 April
25%	Final exam: Thursday 13 May 2020, 10:30 am -12:30 p.m., location TBA.

No books, notes, or calculators are allowed on exams or writing quizzes.

Each discussion section's final grade distribution is determined by its students' performance on the three common midterm exams and the common final exam. An individual student's final grade within that distribution depends on all of the work of the course, including the work graded individually by the section's TA.

Canvas site

This course has a site on Canvas, where registered students can find slides from lecture time, videos, worksheets, writing quizzes and solutions, writing explorations, sample exams, and individual grades. A link to the Canvas site is at the website above.

Writing-intensive component

This course is designated as *writing-intensive*. That is, writing is an integral part of the course, and the course grade is tied directly to the quality of the student's writing as well as to knowledge of the subject matter.

Before each writing quiz and exam, some **writing problems** will be assigned but not collected. Instead, one or more of these problems, or problems very similar, will be chosen to appear on the writing quiz or exam. They will be graded with the quality of the exposition as well as the mathematical content in mind.

After each of the first five writing quizzes, students will reflect on their writing through a **writing exploration** activity. See below for more information about the writing explorations.

Oral presentation

Mathematicians often communicate with one another by talking at a board. The oral presentation is meant not as an examination but rather an opportunity to practice this form of communication.

The presentation will be short – no more than five minutes – and consists of presenting an example or problem solution during lecture, discussion, the lecturer's office hour, or a TA's office hour.

The presentation must be scheduled in advance, and must involve responding to questions from instructors and/or students. More information about scheduling and planning your presentation will be given early in the semester.

TEX project

Communicating about mathematics requires careful use of language and symbols. Typesetting mathematics is an essential skill for communicating technical information in a readable format.

TEX (pronounced *tech*) is a typesetting system that is used almost universally in the mathematical and scientific community. Compilers that convert TEX markup language (in a `.tex` file) into `.pdf` documents are widely available, including free online compilers like Overleaf.

The project will consist of a one-page typeset document containing your solution to a problem in the course's textbook or another source, planned in advance with your TA.

More information about scheduling and planning your project, and a template for the `.tex` files that you create, will be given early in the semester.

Writing explorations

Improving our mathematical writing is a process. Five writing explorations, one after each of the first five writing quizzes, will prompt students to reflect on their writing from the previous quiz. These explorations are not quiz rewrites or revisions but rather open-ended opportunities to focus on specific elements of the practice of writing.

Academic dishonesty

See the Student Conduct Code, a link to which is posted on the course website, for general information. Academic dishonesty will result in a report to the Office for Community Standards, and penalties can include a grade of zero on the task in question and/or a failing grade in the course.

Academic dishonesty certainly includes cheating on writing quizzes and exams, but also includes copying from outside resources such as the book's instructors manual. Collaborating is encouraged, but **your work must be in your own words**. Any outside sources and collaborators must be cited on the TEX project.

Other policies

A link to other general policy statements – including statements about equal opportunity, disability accommodations, and mental health resources – appears on the course website above.

A tentative schedule,

listing the textbook sections covered during lecture time, and the dates for quizzes, writing explorations (WE), and exams.

Day	Date	Lec	Quizzes	WE due	Exams
Tu	21 Jan				
W	22 Jan	1.1			
Th	23 Jan				
F	24 Jan	1.2			
M	27 Jan	1.3			
Tu	28 Jan				
W	29 Jan	1.4			
Th	30 Jan		Quiz 1		
F	31 Jan	2.1			
M	3 Feb	2.1			
Tu	4 Feb				
W	5 Feb	2.1			
Th	6 Feb				
F	7 Feb	2.2			
M	10 Feb	2.2			
Tu	11 Feb			WE1 due	
W	12 Feb	2.2			
Th	13 Feb				**Exam 1**
F	14 Feb	2.3			
M	17 Feb	2.3			
Tu	18 Feb				
W	19 Feb	2.3			
Th	20 Feb		Quiz 2		
F	21 Feb	2.4			
M	24 Feb	3.1			
Tu	25 Feb				
W	26 Feb	3.2			
Th	27 Feb				
F	28 Feb	3.3			
M	2 Mar	3.3			
Tu	3 Mar			WE2 due	
W	4 Mar	3.3			
Th	5 Mar		Quiz 3		
F	6 Mar	3.4			

Day	Date	Lec	Quizzes	WE due	Exams
M	9 Mar		break		
Tu	10 Mar		break		
W	11 Mar		break		
Th	12 Mar		break		
F	13 Mar		break		
M	16 Mar	3.4			
Tu	17 Mar				
W	18 Mar	3.4			
Th	19 Mar				**Exam 2**
F	20 Mar	4.1			
M	23 Mar	4.1			
Tu	24 Mar			WE3 due	
W	25 Mar	4.1			
Th	26 Mar		Quiz 4		
F	27 Mar	4.2			
M	30 Mar	4.2			
Tu	31 Mar				
W	1 Apr	4.3			
Th	2 Apr				
F	3 Apr	4.3			
M	6 Apr	4.4			
Tu	7 Apr			WE4 due	
W	8 Apr	4.4			
Th	9 Apr		Quiz 5		
F	10 Apr	4.4			
M	13 Apr	8.1			
Tu	14 Apr				
W	15 Apr	8.1			
Th	16 Apr				**Exam 3**
F	17 Apr	8.2			
M	20 Apr	8.2			
Tu	21 Apr			WE5 due	
W	22 Apr	8.3			
Th	23 Apr	no class			
F	24 Apr	no class			
M	27 Apr	8.3			
Tu	28 Apr				
W	29 Apr	5.1			
Th	30 Apr		Quiz 6		
F	1 May	5.2			
M	4 May	5.2			
Tu	5 May				
W	6 May	rev.			
W	13 May				**Final**