Syllabus

CSE 20110: Discrete Mathematics

1 Course Staff

		Name & Email	Office	Personal Website
Instructor		Daniel Gonzalez Cedre dgonza26@nd.edu	313 Cushing Hall	https://daniel-gonzalez-cedre.github.io

2 Weekly Schedule

Mon.	Tues.	Wed.	Thurs.	Fri.
Lecture 209 DeBartolo 11:30 — 12:20		Lecture 209 DeBartolo 11:30 — 12:20	Recitation 209 DeBartolo Hall 4:00 — 8:00	Lecture 209 DeBartolo 11:30 — 12:20
Office Hours 313 Cushing Hall 1:00 — 3:00		Office Hours 313 Cushing Hall 1:00 — 3:00		

3 Description of the Course

3.1 Course Summary

This course will serve as a formal introduction to the foundations of mainstream mathematics; our objective is to develop your mathematical maturity while giving an overview of some topics relevant to the subfield of computer science. First, we will familiarize ourselves with the classical **First-Order Logic**, the *lingua franca* of modern mathematics. Using this language, we will establish an axiomatic system called **Zermelo-Fraenkel Set Theory**. With this as our foundation, we will branch out and explore various topics in mathematics, including **Recursion**, **Cardinality**, **Number Theory**, and **Graph Theory**. If time permits, we may also make short detours in other interesting areas such as **Algebra** and **Computability**. Throughout the course, there will be a *strong* emphasis on proofs and the art of proof-writing.

3.2 Course Topics to be Covered

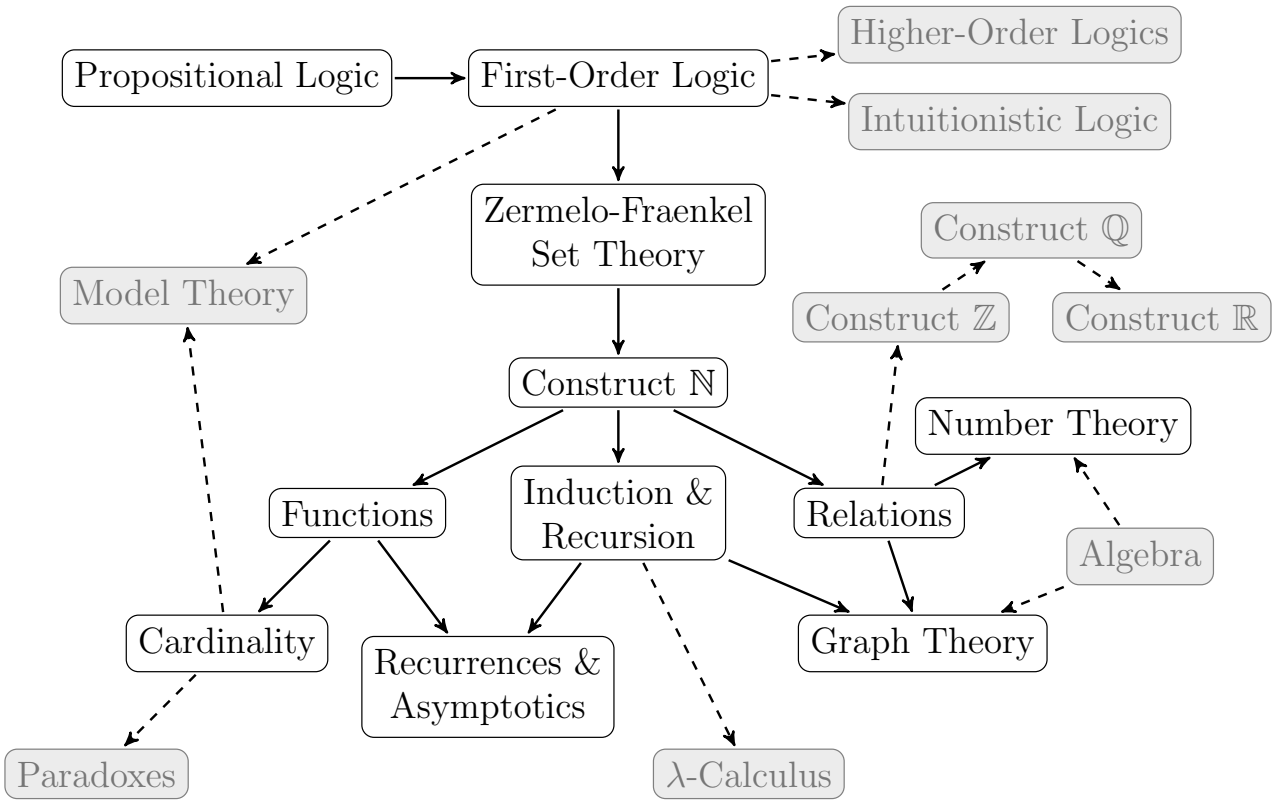

Figure 1: Greyed-out topics are tentative and will only be covered if there is time and interest.

4 Grading & Assignments

4.1 Exams

There will be two interim exams and one final exam. The first exam will be on **Feb. 24th** and will cover the material up until asymptotic analysis. The second exam will be on **Apr. 14th** and will cover the material between functions and number theory. The final exam will be on **May 10th** at **4:15pm** and will be cumulative. *If the final exam grade is greater than the lesser of the two interim exam grades, the lower of those two internim grades will be replaced by the final exam grade.*

4.2 Problem Sets

There will be 11 problem sets, which will be due at the beginning of class on the last class day of every week *unless* there is an exam or holiday scheduled for that week. *The lowest grade of these 11 assignments will be dropped.* Problem sets will typically be released one week prior to their due date. Solutions to the problem sets will be posted automatically at the end of class on the same day they are due.

4.3 Grading Scale & Breakdown

Figure 2: All grades within 0.5 of the next highest letter grade will be rounded up.

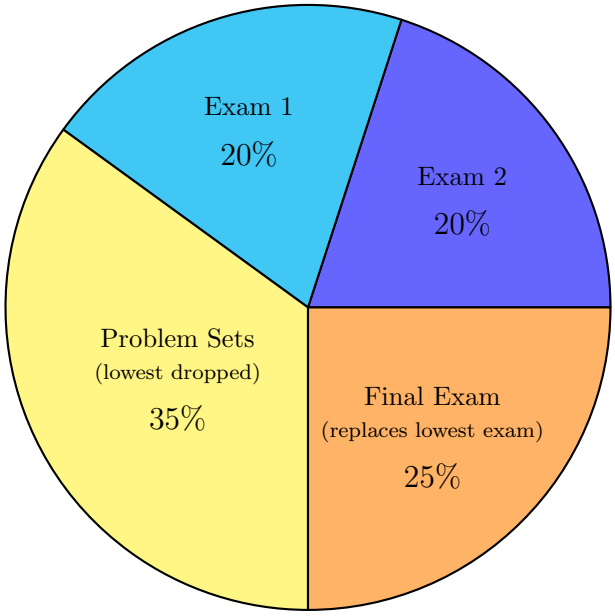

Figure 3: Breakdown of grades by assignment type.

4.4 Late Policy for Problem Sets

Problem sets will be due on their respective due dates *at the start of class* and can be submitted in-person or via email (preferably typeset using LaTeX). Solutions will be uploaded at the end of class time on the due date for the corresponding assignment. Therefore, *any assignments received after the end of class on the due date will receive a grade of 0.*

4.5 Make-Up Policy for Exams

If you are unable to attend an exam for any nontrivial reason, please speak to the instructor so that arrangements can be made. Eligible students will have the option of taking a make-up exam or having their final exam grade count for their absent exam. *Absent exams without a valid excuse will be replaced by the final exam grade.*

5 Textbooks

There is no required textbook for this course. If you would like to supplement your learning or would like a reference text, "Discrete Mathematics and its Applications" by K. Rosen is the standard textbook used at many universities. The set theory section of this course will draw largely from "Set Theory" by T. Jech., but this is a graduate-level textbook and may not be appropriate for direct consumption. The graph theory section will be mainly inspired by the treatment in "Graph Theory" by R. Diestel.

Figure 4: Some relevant, but not required, texts for this course.

6 Communication & Technology

6.1 Course Websites

The Canvas page for this course can be found at https://canvas.nd.edu under *SP23-CSE-20110-01*. Material such as lecture recordings, problem sets, and solutions will be posted here. Alternatively, https://daniel-gonzalez-cedre.github.io/2023sp/discrete-math will have some quick links to the syllabus, calendar, problem sets, and the lecture notes.

6.2 In-Class Video Recording

Lectures will be recorded using the in-class recording hardware/software and then uploaded to Canvas under the "Panopto Video" tab on the left-hand side.

6.3 Slack Server

A Slack server has been created for this course. It is also intended for general discussion and quick messaging (related to the course) between students and the instructor, and will be the primary way announcements are made.

7 Honor Code & Cheating

Table 1: The Rules of Engagement.

	Friends	Resources	Solutions
Consulting	ALLOWED	ALLOWED	FORBIDDEN
Copying	FORBIDDEN	CITE	FORBIDDEN

Notre Dame Students are expected to abide by the Academic Code of Honor Pledge:

> *As a member of the Notre Dame community, I acknowledge that it is my responsibility to learn and abide by principles of intellectual honesty and academic integrity, and therefore I will not participate in or tolerate academic dishonesty.*

8 Disabilities & Accommodations

8.1 Students with Disabilities

The policy and practice of the University of Notre Dame provides reasonable accommodations for students with properly documented disabilities. Students who have questions about Sara Bea Accessibility Services (SBAS) or who have, or think they may have, a disability are invited to contact SBAS for a confidential discussion in the Sara Bea Center for Student Accessibility Services or by phone at (574)-631-7157. Because the University's Academic Accommodations Processes generally require students to request accommodations well in advance of the dates when they are needed, students who believe they may need accommodation for this course are encouraged to contact SBAS at their earliest opportunity. Additional information about SBAS and the process for requesting accommodations can be found on their website.

8.2 Mental Health

If you are having mental health issues that are interfering with your ability to function in this course, please reach out to the instructor or to the University Counseling Center so that we can accommodate you. The University Counseling Center provides cost-free and confidential mental health services to help you manage personal challenges that may threaten your emotional or academic well-being. For more information, please visit their website: https://ucc.nd.edu.

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