

## Mathematics 347 — Fundamental Mathematics

Section D1 (11:00–12:00 MWF in 143 Henry)

**Instructor:** Charles Rezk

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**Office hours:** Monday, Wednesday, and Friday 12:30–1:30 pm.

**Goals of the course:** The goal of this course is to introduce students to some of the fundamental ideas of mathematics, and to teach the communication of mathematics through reading and writing proofs.

**Textbook:** D'Angelo and West, *Mathematical Thinking: Problem Solving and Proofs*, Second edition.

**Course requirements:**

*Final:* Scheduled for Monday, May 10, at 7:00–10:00pm.

*Hour exams:* There are three, in class, tentatively scheduled for Monday, February 15; Monday, March 15; Monday, April 19, though this will probably change.

*Quizzes:* There will be occasional short quizzes, at the instructors discretion.

*Homework:* There will be two kinds of homework assignments.

- *Problem Sets (PS).* A problem set is a set of four to eight problems, usually taken from the book, to be due on Fridays. A subset of the problems will be graded. Late homework is not accepted. The lowest PS score will be dropped.
- *Daily Problems (DP).* These will be assigned twice a week. They will be collected, but only graded to see if an attempt was made. You are allowed to drop two of these.

*Reading in the textbook* for each lecture. (Check webpage for assignment.)

*Homework policy.* Collaboration in studying and working on homework problems is highly encouraged. However, the written work you turn in must be entirely your own: don't copy your classmates. In any case, the purpose of collaboration is to help you understand the material better. Collaborating without understanding what is going on is not helpful; if you do this, it will become apparent on exams.

**Grading:** Your final grade will be determined by the following weighing: final exam 30%, hour exams 15% each, problem sets 20%, daily problems and quizzes 5%.

**Course schedule:** The following is a list of topics to be covered, along with the corresponding sections of the text. (You should at least skim the appropriate section of the text before coming to lecture.) Each topic should take four or five lectures. I may change the order around slightly, and I might introduce (or remove) an additional topic or two.

Numbers, Sets and Functions (§1)

Language and Proofs (§2)

Induction (§3)

**First exam** (provisionally February 15)

Bijections and Cardinality (§4)

Combinatorial Reasoning (§5)

**Second exam** (provisionally March 15)

The Real Numbers (§13)

Sequences and Series (§14)

**Third exam** (provisionally April 19)

Divisibility (§6)

Modular Arithmetic (§7)

Rational Numbers (§8)

**Final exam** (May 10)