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MATH 250, Foundations of Mathematics  
Aug 24 - Dec 6, 2022

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Section 005 TuTh 2:30-3:45  
MSC E308a

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**Instructor:** David Zureick-Brown, Office: W430 Math and Science Center

**Contact:** [dzureic@emory.edu](mailto:dzureic@emory.edu); office phone: (608) 616-0153

**Office Hours:** Mondays 4:30-5:30pm, via Zoom and by appointment.

<https://emory.zoom.us/j/93045569704>

**Required textbook:** “An Introduction to Abstract Mathematics”, Bond and Keane

**Course website:** <http://www.math.emory.edu/~dzb/teaching/250Fall2022/>

**Other online tools that we will use:**

- <https://miro.com/>
- <https://www.overleaf.com/> or <https://latexbase.com/>

It will be worthwhile to familiarize yourself with these ahead of time and to make accounts.

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**Prerequisites:** Math 112 or equivalent

**Learning objectives:** we will cover the following topics.

- Logic – statements, negation, converse, etc.
- Mathematical prose and rigor – how to write mathematics correctly and in complete sentences.
- Techniques of proof – proof by contradiction, induction, proof by cases;
- Sets, relations, functions – the building blocks of mathematics
- Some additional topics: Cardinality (different sizes of infinity); Numbers (what they are, divisibility transcendental numbers vs. algebraic numbers (i.e., the difference between  $\pi$  and  $2^{(1/2)}$ ))

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**Homework is due Tuesdays at 2:25pm**, via Canvas. The assignment should be submitted as a single pdf, produced using L<sup>A</sup>T<sub>E</sub>X. Please name your file sensibly (I would prefer: lastname-HW-01.pdf). See the document [here](https://www.math.emory.edu/~dzb/teaching/250Fall2022/assignments-math-250.pdf)

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for a list of all assigned work and a weekly breakdown of the course content.

**Grading:** Your grade will consist of the following. Your lowest weekly assignment will be dropped.

Weekly Homework Assignments	40%
Midterm	30%
Final Exam	30%

**Grade scale:** A lower bound on your grade is given by the following table.

A = 93-100	B+ = 87-89	C+ = 77-79	D+ = 67-69	F = 0-62
A- = 90-92	B = 83-86	C = 73-76	D = 63-66	
	B- = 80-82	C- = 70-72		

**Typical rubric:** Proofs will typically be graded on the following rubric (out of 10 points).

10	Flawless
9	Basically correct, but not literally 100% correct
7	Mostly correct, but with at least one error
5	Numerous errors
2	Proof contains a fundamental misunderstanding
0	No part of the proof was correct

**Assignment dates:**

Weekly Assignments	Generally due Tuesdays at 2:25pm via Canvas. Please submit a single pdf, produced by LaTeX
Midterm	Thursday, October 20
Final Exam	Thursday December 8, 3:00pm - 5:30pm

**Rewrites** will be allowed, and in fact expected, on weekly graded assignments, and students will be able to recover up to half of the missed points. To submit a rewrite, please simply resubmit the assignment on Canvas in place of the original one (I will still be able to see the original assignment and be able to compare). You may rewrite a problem multiple times, and you may resubmit a rewrite as late as you like (you can even bring them to the final exam).

To submit a rewrite, please include your original assignment, the date of the original assignment, and please make it clear which problems you are rewriting.

**Late submissions.** Any assignment submitted after the due date will be treated as a “rewrite” (you can receive up to half credit for the assignment).

**Honor Code:** Remember that copying another student’s work is a violation of the Honor Code and will be treated as such. Please review Emory’s Honor Code, available [here](#).

You are free to consult any sources (animate or inanimate) while doing your homework; working in groups is encouraged! But, if you use anything (or anyone) other than your class notes or the texts listed above, you should say so on your homework – please state at the end of every problem any sources used.

On the other hand, you are expected to make an honest attempt to do every problem on your own before consulting other sources.

A good rule of thumb to avoid plagiarism is the following – when doing the final write up of a problem, do not have any text books, web pages, or classmate’s write up open in front of you. If you get stuck when writing up an assignment, go back and look again; just make sure that you organize the mathematics in your head before writing a proof rather than copying a solution from some source. **This is a generous homework policy. Please do not abuse it.**

**Accessibility and accommodations.** Emory University complies with the regulations of the Americans with Disabilities Act of 1990 and offers accommodations to students with disabilities. If you are in need of an accommodation, please contact your instructor to discuss this as soon as possible. All information will be held in the strictest confidence, and appropriate documentation should be presented within a week of the beginning of the course. For more information, please go [here](#).

**Attendance policy.** Attendance is always optional (except for exams). If you are sick, I would prefer that you stay home from class; I have notes and videos from previous semesters that I can send you.