

**MATH 300: FOUNDATIONS OF HIGHER MATHEMATICS
NORTHWESTERN UNIVERSITY, FALL 2013**

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Office Hours: Tuesdays 12–2 and by appointment.

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Office Hours: Tuesdays 2–3:30 and Thursdays 10–11:30.

Textbook: R. Bond and W. Keane, *An Introduction to Abstract Mathematics*.

About the class. This is not a normal math class! I will spend very little time lecturing. Rather, the majority of the in-class time will be spent discussing the material and working on examples, with the lectures given by you, the students. Your attendance and active participation in the class is crucial.

The primary goals of the class are:

Writing and presenting proofs: Clear communication is crucial to modern mathematics. You will be asked to produce carefully written proofs, in correct mathematical English, on your homework. You will give in-class presentations on material from the readings.

Logic and set theory: The theoretical foundation of modern mathematics is a rigorous approach to set theory and logic, which we will develop in this course.

Proof techniques: Mathematics is not just about “material” — much of being a good mathematician involves using various tools, some of which fall under the umbrella of “proof techniques.” You will practice applying such tools in class and on the homework.

Presentations. Each student will give two in-class presentations, based on topics from the text. You should aim for each presentation to last 10 minutes, with questions and discussion afterward. I will provide written feedback after each presentation. I also encourage you to go over your presentations one-on-one with me during office hours, before you give your presentations in class.

The rest of you are not off the hook during your fellow students’ presentations. You are expected to ask questions (or provide answers!) during the presentations; failure to do so will negatively impact the participation component of your grade.

Required readings. You are required to have read the appropriate sections of the textbook before each class. As you read through the section, have a pen and paper handy: write down questions that you have, work through all examples, and memorize all definitions.

Class discussions are based on this material and you should expect to be called on to explain your results. Bring your notes and the textbook to each class.

Homework. Homework plays a key role in learning the material and so is heavily weighted in the grading. There are weekly homework assignments posted on Blackboard. *Homework will be posted no later than Wednesday, due the following Wednesday at the start of class.*

You are encouraged to work with others on the homework, but must write up solutions individually. Please list the names of any students with whom you worked at the top of your paper. The website math.stackexchange.com is a good resource for asking mathematical questions at all levels. Do not simply ask homework questions and copy the answers — you won't learn the material that way. But you may learn a lot from asking related questions. If you use math.stackexchange.com while working on the homework, you must list it (along with the other students you worked with) at the top of the page. Failure to do so will be considered cheating.

Late or illegible homework is not accepted. Solutions should be concise and neat!

Section. Thursdays 9–10, in Tech M128. You are responsible for all material covered in section and attendance is expected.

Exams and important dates.

Every Wednesday, starting October 2: Homework due.

Friday, October 25: In-class midterm.

Wednesday, November 27: Last day of class. I will run this as a review period. I will not present new material. I will not count an absence against your participation grade. You may make your own informed decision about whether to attend or to leave early for the Thanksgiving break.

Thursday, December 12: Final exam. 9am.

There are no make-up exams.

Grading: Your grade is determined by:

Homework and participation	30%
In-class midterm	15%
Presentations	15% each
Final	25%

Grading of all assignments is based on a combination of content and form. Your work must demonstrate your mastery of the mathematical ideas required and must be clearly expressed; proper usage of both mathematics and English is required. Class participation is part of your grade and so on-time class attendance is crucial. Failure to attend class and participate adversely affects your grade.

Disabilities. Any student with a disability requesting accommodations is required to register with Services for Students with Disabilities (ssd@northwestern.edu; 847-467-5530) and provide an accommodation notification from SSD to his/her professor, preferably within the first two weeks of class. All information will remain confidential.