

Math 300, Introduction to Mathematical Reasoning

Course time and location: Tuesdays, Thursdays 2:00pm–3:50PM in Hill 423

Instructor: Glen Wilson

Office hours: Hill 512, MW 14:00–15:20 and by appointment

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Website: www.math.rutgers.edu/~wilson47/Teaching/Summer2015.html

Course materials: We will follow the book *A Transition to Advanced Mathematics, 7th Edition* by Douglas Smith, Maurice Eggen, and Richard St. Andre. Additional resources will be posted on the course website.

The following sources are not required. *The Elements of Style* by Strunk and White is an excellent resource for effective writing. Currently, it is \$7 on Amazon. Many students find the book *Proofs and Fundamentals, A First Course in Abstract Mathematics* by Ethan Bloch to be helpful in learning the material. The electronic version of this book can be obtained for free by using your access to SpringerLink from the Rutgers library.

Homework: Homework will be assigned after each class for the topics which were discussed. Every Tuesday, the homework problems from the previous week are due at the beginning of class. The problems will be posted on the official course website. No late homework assignments will be accepted, but your lowest homework grade will be dropped. Homework will account for 20% of your course grade.

Homework writeups: You are allowed, and encouraged to discuss challenging homework problems in groups. Do not consult online forums, or look up solutions to the assigned problems on the internet. The goal is to have *you* learn and understand how to write proofs, not some random person on the internet! Part of the fun of this course is discovering answers to hard problems just by thinking carefully. Your proofs and solutions should be in your own words, even if you discussed the problem with classmates.

For each problem, indicate any assistance you received. That is, write down who you worked with on the problem, or which sources you consulted other than the textbook or lecture notes.

Homework assignments should be neatly handwritten, or typed up using the LaTeX typesetting system. If your homework writeup consists of multiple sheets of paper, please staple the pages together. Please order the solutions to the problems according to the order in which they are listed. For proof questions, clearly restate the proposition you will prove, and clearly indicate where proofs begin and end. For proof questions, you do not need to include scratch work unless otherwise indicated. Write your name on your homework assignment. It is suggested that you write your name on every page which you submit.

If you submit handwritten assignments, it is imperative that your handwriting is neat and your work is well organized. Do not include large portions of crossed out work. If you need to cross out something, just use a single line to cross out

the text. Please use a pen with black or blue ink. Pencil is acceptable, but not recommended as eraser marks can make the text difficult to read.

If you decide to type your homework assignments up using LaTeX, please ensure that you leave left and right margins of at least 1.5in for the grader's comments.

I will not accept homework assignments submitted via any electronic means. You must submit a hard copy: on time, in class.

If your homework assignment does not meet the above criteria, you may receive no credit for your assignment!

Quizzes: A quiz will be given in every class except when there is an exam. Quizzes will account for 10% of your course grade. No makeup quizzes will be given, but your lowest 2 quiz grades will be dropped. Quizzes will typically cover the material discussed in class, so come to class prepared!

Exams: There will be 2 in class midterms for this course. Each will be 1 hour 20 minutes, given at the beginning of our regular class time. Each midterm is 20% of your course grade. On the last day of class, there will be a 3 hour final exam. The final exam is 30% of your course grade. No notes, books, calculators, or computing devices are allowed during the exams.

Expectations: You are expected to come to every class, and actively participate. Cell phones, laptops, and other similar computing devices are not permitted in class during lecture. You are expected to thoroughly work through the assigned reading for each class, and come to class with questions. You are expected to spend around 10 hours doing homework and preparing for class each week. If you spend significantly more time than this, please let me know!

How to study for this course: In many ways, *Introduction to Mathematical Reasoning* is different from other math courses you may have taken, like calculus 2. We want you to learn how to think and reason carefully about mathematical objects, and then explain your ideas clearly and concisely. What follows are suggestions on how to get better at reasoning about mathematical objects and communicating your ideas.

You should read the text with pen and paper in hand. It is very easy to passively read through the text, and extract little information; don't let this happen to you. Ask yourself questions while you read, and write them down. Test your understanding by solving all of the assigned homework problems, and then solve some more. As you will soon see, it is imperative to know the precise definitions of the objects and concepts we will study. You should come up with your own examples and counterexamples for everything we study. Do not memorize a proof. If you are having trouble understanding a proof, work through the proof for a specific example, and see how the proof works with your example. Sometimes this is all it takes to see through the abstract language.

Writing proofs can be quite challenging, and it takes a lot of practice to take your ideas and translate them into a proof which any mathematician can read and follow. You will gain a lot of experience by doing the homework assignments. Take your homework writeups seriously, and you will learn a lot from them.

I encourage you to come to my office hours. This is a great way to get feedback and practice solving problems, and discussing mathematics.

Academic integrity policy: All students in the course are expected to be familiar with and abide by the academic integrity policy, which can be found at the following website.

<http://academicintegrity.rutgers.edu/academic-integrity-at-rutgers>

Violations of the policy are taken very seriously.

Disability accomodations: Full disability policies and procedures are indicated at <http://ods.rutgers.edu/>. Students with disabilities requesting accommodations must present a Letter of Accommodations to the instructor as early in the term as possible. Please consult the following website.

<https://ods.rutgers.edu/my-accommodations/letter-of-accommodations>