Math 300A   Introduction to Mathematical Reasoning   Autumn 2017
Syllabus

The **course website** is at `https://sites.math.washington.edu/~arms/m300A17/`, and includes a link to a pdf of this page.

No overloads/wait list/add codes for this section. If there is space in the class but you cannot add the course, see the Math Advising Office (PDL C-036) to find out if and how you may add the course. If you are a major and not yet enrolled, sign up for "Notify-UW" to find out if and when there are openings in the course. See "Announcements" on the course website for links to "Notify-UW" and more information about getting into closed Math classes.

Instructor: Professor Judith Arms, C338 PDL.
Office hours for first week: After class at the classroom; MW 2:30-3:30 and by appointment in my office. (A Catalyst survey will open Thursday 9/27 for enrolled students to express time preferences for office hours for the rest of the quarter.)

Text: *Mathematical Reasoning: Writing and Proof, Version 2.1*, by Ted Sundstrom. It is available free online (link at course website), or you can buy a hard copy from the text website, Amazon, or at the bookstore. If you buy it from the bookstore, check whether it's "Version 2.0;" if so, check the list of corrections online.

Important Dates:

Homework due	most Wednesdays, starting 10/4
Two Quizzes	TBA, probably in week 4 (10/16-20) and week 8 (11/13-17)
Midterm	TBA, probably 11/1, 3, or 6
Final Exam	Monday, June 5, 8:30-10:20

All tests and quizzes will be in our regular classroom. The date and time of the final exam are set by the university and cannot be changed.

Grades: Course grades will be based on a total of 160 course points, as follows.

Homework	35 *course** points
Quizzes	20 points (10 points each)
Midterm	40 points
Final exam	65 points

*Assignment scores as percentages will be averaged, and the average for the quarter converted to course points, 100% = 35 course points, etc.

The conversion scale from points to grades will be set at the end of the quarter. The preliminary estimate of this scale is that the minimum for a 4.0 will be 145 points and the minimum for a 2.0 will be 100 points. The actual scale will be no tougher than the preliminary scale, probably will be slightly more generous, and will be partly based on the performance of the class.

Brief overview of the course

Many or maybe all of your previous math courses were focused on learning algorithms for solving particular types of problems. While some proofs may have been presented, understanding them was not the major goal of the course. In contrast, as the title indicates, Math 300 is focused on mathematical reasoning: how do we know if a mathematical statement is true?

For this reasoning, we use "Mathematical English." Every discipline has its own vocabulary, including words used only in the discipline and also everyday words used in special ways. This is often call the "jargon" of the discipline. Mathematics is especially prone to using everyday words to mean very particular things, possibly different from the usual meaning. Learning mathematical English is similar in many ways to learning a foreign language. So in some ways, Math 300 is more like a foreign language course than like your previous math courses. To succeed in many advanced mathematics courses, you must learn to understand, speak, and write in mathematical English.

Math 300 is designed to serve as a "bridge" course from your previous math courses mostly on problem solving and algorithms, to more advanced courses depending more on mathematical reasoning. Goals of the course include learning to read proofs critically and with more thorough understanding than previously; to construct your own proofs; to communicate mathematics, and in particular proofs, clearly, both orally and in writing; to see how some of the math you already "know" can be deduced from a short list of assumptions (called "axioms"); and to study sets, functions, and possibly some other general-purpose mathematical topics, in greater depth than your previous courses.

How to do well in the course

Attend class, and participate in discussion. You are responsible for all material discussed in class. Do not skip class. In case you are unavoidably absent, know at least two people in the class who take good notes and will let you borrow their notes. I may post some brief notes on the course website about what was covered in class, but they will *NOT* be comprehensive.

Talk mathematics! Come to office hours and talk to me and other students about the course. Ideally, form a study group with others in the class, and meet once or twice a week.

Do all the homework. The homework includes reading and practice problems as well as problems you have to write up and hand in. Do all of it.

Start written homework early and expect to do multiple drafts. For your previous computationally oriented math courses, you might expect to do a problem in "one pass" – even if you got stuck, you would just continue your work after getting help. Writing proofs is more like writing a paper. Expect to do some written brainstorming or outlining, then a first draft, and then to write the final version you will hand in, starting over from the beginning. More guidance about how to write up your homework will be posted on the course website shortly, and will be discussed in the second class meeting.

Study your graded homework. Even if you got full points, there may be comments about how to say things more clearly. If you lost points, rewrite the solution. I'm happy to discuss such a rewrite in office hours. The main point of homework is not "points," it's learning! Similar comments apply to the midterms: the course is cumulative, each test will include everything in the course up to that test.