

Math 300: Introduction to Mathematical Reasoning

Spring 2019

Instructor: Joseph Palmer

Email: j.palmer@rutgers.edu

Office: Hill 340

Office Hours: Wednesdays 1-3pm

Personal Website: <http://sites.math.rutgers.edu/~jp1535>

Course Website: http://sites.math.rutgers.edu/~jp1535/teaching/2019spring_math300

Course Times: 6:40-8:00pm Mondays and Wednesdays

Room: TIL-251

Course Description:

In this course the students will be introduced to formal arguments and rigorous mathematical proofs. The subject matter used to introduce proof writing will be a variety of topics from basic set theory, combinatorics, and algebra. There is particular emphasis on writing, discussing, and explaining mathematics clearly.

Tentative Outline:

We will use textbook *A Transition to Advanced Mathematics (eighth edition)* by Smith, Eggen, and St. Andre (ISBN: 1-285-46326-9). We will cover most of chapters 1-4 and (time permitting) portions of chapters 5 and 6. This will approximately cover four topics:

I. Logic and Basic Proofs

An introduction to formal arguments and proofs This is the basis for all upper division math courses.

II. Sets and Induction

Set theory and advanced methods of proof, including the method of mathematical induction.

III. Relations, Partitions, and Functions

Formal definition of a function between two sets and its properties.

IV. Advanced topics: Cardinality and Introductory Algebra

Cardinality ("size") of finite sets. Cardinality of infinite sets and the axiom of choice. Time permitting, algebraic structures and groups.

Check the course webpage for the calendar which will be updated throughout the semester.

Grading:

Breakdown of grades:

Homework	9%
Workshop	5%
Midterm 1	23%
Midterm 2	23%
Final	40%

Homework:

There will be approximately one homework assignment per week, usually collected on Mondays. It is due **in class** and your **lowest homework grade will be dropped** so I will not accept any late assignments. The homework will be posted, with due dates, on the course webpage. These homework assignments will be relatively lengthy, and I encourage you not to try to complete them in a single night.

Exams:

There will be two midterms and one final exam. Midterm 1 will be taken about one third of the way through the course and is tentatively scheduled for Monday, March 11th.

Integrity:

You may discuss the homework assignments with your classmates, but what is turned in to me must be written up independently. Any work you turn in should be written in your own words, not copied from a source (such as another student's homework or a webpage). Remember you will be alone for the exams, which are the majority of your grade, so cheating on the homework doesn't help you much anyway. Of course, I will not tolerate any cheating during the midterms or the final. See academicintegrity.rutgers.edu for more details about the academic integrity policies at Rutgers.

Disability:

If you have a disability, please coordinate with the Office of Disability Services as early as possible in the semester and I will do my best to accommodate your needs.

Further Questions?

If you have any questions about this course, please do not hesitate to email me or come to my office hours.