

MAT320: INTRODUCTION TO REAL ANALYSIS

Fall 2023

Instructor:	Semon Rezhikov	Time:	Tu Th 1:30 – 2:50
Email:	semonr@princeton.edu	Place:	322 Fine Hall

Description: Introduction to real analysis, including the theory of Lebesgue measure and integration on the line and n -dimensional space. Applications of measure theory and the Lebesgue integral to other topics such as introductory probability theory and functional analysis.

Students are expected to have some familiarity with mathematical proofs. We will aim to approach the topic in a rigorous manner. However, the course will not be as difficult as MAT 425, which covers roughly the same material.

Course Pages: <http://www.rezchikov.me/mat320>, Canvas.

Office Hours: Tuesday after class, and Thursday 10am — 11am, or by appointment, in Fine 609.

Contacting me: Please email semonr@princeton.edu and put MAT320 in the subject.

Textbooks:

- (Primary) Royden and Fitzpatrick, *Real Analysis*, 4th Ed, Pearson, 2010.
- (Optional) Stein and Shakarchi, *Measure Theory, Integration, and Hilbert Spaces*, PUP, 2005.

Prerequisites: MAT 201 and 202 or equivalent. We will assume a level of familiarity with proofs.

Outline: We will begin by studying Chapters 1-6 in Royden and Fitzpatrick, and afterwards explore more advanced topics discussed throughout the book, as time permits.

Grading Policy: Problem Sets (20%), Quizzes (25%), Midterm (20%), Final Exam (35%).

Problem sets: Posted Thursdays, due in class on subsequent Thursdays. You may work with other students on the problem sets but you must write up your own solutions. Late assignments will not be accepted. The lowest problem set grade is dropped.

Grader: Hyungjun Choi, hc9325@princeton.edu.

UCA: Stephen Jiang, sj9425@princeton.edu. Problem Sessions TBA.

Quizzes: We will have short weekly quizzes on Tuesdays. They should take no longer than 20 mins and will test you on basic comprehension. The lowest two quiz grades are dropped.

Midterm: In class on October 12.

Final Exam: The final exam date and location will be set by the course registrar.

Attendance Policy: Regular attendance is essential and necessary to take the quizzes. Please contact me if you are forced to miss a Tuesday class.