

MATH 510 – Introduction to Analysis I

Fall 2021, TR 12:30–13:45

INSTRUCTOR: Maxim Zinchenko (maxim@math.unm.edu)

COURSE WEBPAGE: will be posted on [UNM Learn](#)

COURSE PREREQUISITES: Proof based/Advanced Calculus and Linear Algebra.

COURSE DESCRIPTION: Math 510 is an introductory graduate level course in Real Analysis. It is the first part of a four semester sequence. The first two of these parts (Math 510 and 511) are the courses that prepare for the qualifying exam in Real Analysis.

Students taking the course are expected to be proficient in computational aspects of single and multivariable calculus as well as be able to read, comprehend, and create epsilon-delta proofs. If you have not taken a rigorous proof based calculus course you should take Math 501 instead of Math 510.

The main topics of the course include: basic point set topology, metric spaces, compact and connected spaces; sequences and series; functions between metric spaces, limits, continuity, connections to compactness and connectedness, uniform convergence and series of functions. For functions of a single variable we will discuss differentiation properties and Riemman–Stieltjes integrals. Time permitting we will study Fourier series and the classical Stone–Weierstrass approximation theorem.

REQUIRED TEXTBOOK: Principles of Mathematical Analysis by W. Rudin, 3/E, 1976. We will cover chapters 1–7, and time permitting parts of chapter 8.

COURSE ASSESSMENT: Your course grade will be based on 2 exams (40%), homework (40%), and class participation (20%). No late assignments will be accepted but the lowest homework will be dropped to accommodate for unavoidable circumstances such as emergencies, family events, illnesses, etc. On all assignments clarity of presentation will be graded as well as correctness.