

OFFICIAL SYLLABUS

350-INTRODUCTION TO ANALYSIS

Adopted – Fall 2003¹

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Catalog Description

Logic, set theory, real numbers. Topology on the real line. Cardinality. Sequences and series of real numbers; limits and continuity; sequences and series of functions. Prerequisites: 223 and 250 with a C or better.

Textbook

Introduction to Real Analysis, 4th Edition by Robert G. Bartle and Donald Sherbert. ISBN-13: 978-0471433316

Course Outline and Topics

Chapter 2, The Real Numbers

Algebraic and order properties of real numbers, absolute value, the completeness properties of real numbers, applications of supremum, intervals.

Chapter 3, Sequences and Series

Sequences and their limits, limit theorems, monotone sequences, subsequences, and the Bolzano-Weierstrass Theorem. The Cauchy criterion. Properties of divergent sequences and introduction to infinite series.

Chapter 4, Limits of Functions

Limits and limit theorems, and some extension of the limit concept.

Chapter 5, Continuous Functions

Continuity, combinations of continuous functions, continuity on intervals. Uniform Continuity, monotone and inverse functions.

Chapter 8, Sequence of Functions

Pointwise and Uniform Convergence.

Course Objectives

At the conclusion of this course, students should be able to:

- 1) understand statements and proofs of theorems involving real analysis of a single variable, including topics such as limits, sequences and series, limits, and continuity
- 2) construct proofs of moderate complexity in these areas and determine the validity of proofs constructed by others
- 3) compute quantities in real analysis such as the suprema/infima, limits of functions and sequences, and limits of sequences of functions
- 4) determine examples and non-examples of major concepts in real analysis

Any instructor should cover all of the material specified, additional sections are optional.

¹ Moved to 4th Edition in 2012; course objectives added in October 2014 by Department consent.