

OFFICIAL SYLLABUS
MATH 350-Introduction to Analysis

Adopted Spring 2019

(Committee: Drs. S.-F. Chew, J. Loreaux, J. Parish, M.-S. Song)

Catalog Description. Real numbers. Topology on the real line. Sequences of real numbers; limits of functions, continuity of functions; differentiation.

Prerequisites: 223 and 250 with a C or better.

Textbook: *A Friendly Introduction to Analysis Single and Multivariable, 2nd edition by Witold A. J. Kosmala* ISBN: 978-0130457967

Course Outline:

Chapter 1, Introduction

1.7 Ordered Field and a Real Number System

1.8 Some Properties of a Real Number

Chapter 2, Sequences

2.1 Convergence

2.2 Limit Theorems

2.3 Infinite Limits

2.4 Monotone Sequences

2.5 Cauchy Sequences

2.6 Subsequences

Chapter 3, Limits of Functions

3.1 Limits at Infinity

3.2 Limits at a Real Number

3.3 Sided Limits

Chapter 4, Continuity

4.1 Continuity of a Function

4.2 Discontinuity of a Function

4.3 Properties of Continuous Functions

4.4 Uniform Continuity

4.6 Projects: Part 1 Compact Sets

Chapter 5, Differentiation

5.1 Derivative of a Function

5.2 Properties of Differentiable Functions

5.3 Mean Value Theorems

5.5 L'Hospital's Rules

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 sequences, limits of functions, continuity of functions and differentiation.
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, limits of sequences and 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