

MATH 412 Introduction to Analysis I

1. Catalog Description

MATH 412 Introduction to Analysis I

4 units

Prerequisite: MATH 306.

Introduction to concepts and methods basic to real analysis. Topics such as the real number system, sequences, continuity, uniform continuity and differentiation. 4 lectures.

2. Required Background or Experience

Math 306, completion of a calculus sequence which includes functions of several variables, and sufficient mathematical maturity.

3. Learning Objectives

Students should:

- a. Re-emphasize and obtain a deeper understanding of the definition of function in the context of this course.
- b. Obtain an understanding of the limiting processes basic to functions of a single variable. This understanding will make much of the literature of mathematics accessible, and will provide a deeper insight into computational processes with which students are somewhat familiar.

4. Text and References

See course supervisor. Suggested texts include:

- Bartle, Rudin or Goldberg.
- Fundamental Ideas of Analysis, Reed.

5. Minimum Student Materials

Paper, pencils, and notebook.

6. Minimum University Facilities

Classroom with ample chalkboard space for class use.

7. Content and Method

- a. The real number system
- b. Sequences
- c. Topology of \mathbb{R}^1
- d. Continuity and uniform continuity

e. Differentiation

8. Methods of Assessment

The primary methods of assessment are: essay examinations, quizzes and homework. Typically, there will be one or more hour-long examinations during the quarter, and a required comprehensive final examination. Students are required to show their work and are graded not only on the correctness of their answers, but also on their understanding of the concepts and techniques.