MATHEMATICAL ANALYSIS I

MATH 4230/8236

Course Description:

Provides a theoretical foundation for the concepts of elementary calculus. Topics include ordered fields And the real number system, basic properties of complex numbers, metric space topology, Sequences and series in Rk, limits and continuity in a metric space, monotonic functions.
3 credits

Prerequisites:

MATH 3230/8235 or equivalent

Overview of Content and Purpose of the Course:

To provide students with a theoretical foundation for the concepts of advanced calculus and to provide the background for more advanced courses in analysis.

Major Topics:

1. Real and complex number systems, ordered fields

2. Elementary topology
   a. Euclidean n-space
   b. Metric spaces
   c. Compactness (in either setting), Bolzano-Welerstrass Theorem, Heine Borel

3. Limits and Continuity (metric space)

4. Differentiation in R

5. Infinite series and infinite products

Methods:

The class will be presented in lecture/discussion form with student questions and discussion encouraged. Graduate students will be required to complete assignments not required of undergraduates.

Textbook:

Rudin, Walter. *Principles of Mathematical Analysis, 3rd ed*. New York: McGraw-Hill Education, 1976.

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