Objective: To develop the foundations for the analysis of real valued functions. The primary focus will be on proof.

Intended for: All majors in the mathematical sciences and any students who wish to pursue graduate study in Mathematics or its applications, physics or engineering.

Prerequisite: MATH 202 and MATH 210 with grades of C or better

Text: An Introduction to Analysis 2nd Edition by Bilodeau, Thie and Keough

Topics/Textbook Sections/Weeks

The Real Numbers/ (Ch.1)/ 2 1/3 weeks
Sets, Functions, Algebraic and Order properties, The positive integers, Least Upper Bound Axiom/ Completeness

Countability: What's bigger than infinity? Handout/ 2/3 week

Sequences/ (Ch. 2)/ 3 weeks
Limits of bounded, monotone, and Cauchy Sequences and of subsequences.
Limit Theorems, Tending towards infinity.

Continuity and limits of Functions/(Ch 3)/ 3 weeks
Limit theorems, One sided limits, Limits involving infinity, Definition and proofs of continuity, Intermediate and extreme values, Uniform Continuity. Optional: Functions of two variables.

Differentiation/ (Ch. 4)/ 3 weeks

Brief Introduction to Integration/ 5.1, 5.2 and 5.3 / 1 week
The Riemann Integral some properties and the Fundamental Theorem of Calculus.

Tests: 1 week

EVALUATION

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<td><strong>Portfolio</strong></td>
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<td><strong>Boardwork and Quizzes</strong></td>
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<td><strong>Tests and Final</strong></td>
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**Graduate students will be assigned special homework/test problems or projects.**