SU Department of Mathematics and Computer Science
SYLLABUS *(Tentative)*
MATH 451/551 *Analysis I*

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

Review of Proof and Calculus Concepts / 0.5 week

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

Countability: What's bigger than infinity? Handout/ 0.5 week

Sequences/ (Ch. 2)/ 2.5 weeks
Limits of bounded, monotone, and Cauchy Sequences and of subsequences.
Limit Theorems, Tending towards infinity .

Continuity and limits of Functions /(Ch 3)/ 2.5 weeks
Limit theorems, One sided limits, Limits involving infinity, Definition and proofs of continuity, Intermediate and extreme values, Uniform Continuity. Functions of two variables.

Differentiation/ (Ch. 4)/ 2.5 weeks
The derivative, Rules for differentiation, The Mean Value Theorem, L'Hôpital's Rule, Inverse Functions. Differentiation in R^2.

Integration/ Ch. 5 / 2.5 weeks
The Riemann Integral some properties and the Fundamental Theorem of Calculus.

Tests: 1 week
total /14 weeks

EVALUATION

Portfolio	20%
Boardwork and Quizzes	10-15%
Written Homework	15-30%
Tests and Final	40-50%

**Graduate students will be assigned special homework/test problems or projects.