SU Department of Mathematics and Computer Science (proposed)
SYLLABUS *(Tentative)*
MATH 452/552 *Analysis II*

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 451 with grade of C or better

Text: An Introduction to Analysis 2nd Edition by Bilodeau, Thie and Keough required. Real Analysis 4th edition by H. L. Royden and P. M. Fitzpatrick on reserve in the library.

Topics/Textbook Sections/Weeks

Review of Analysis I / Chapters 1-4 /1 week
Completeness, Convergence, The Derivative Mean Value Theorem; Differentiability in R^2

Integration/ Chapter 5 / 2 weeks
Upper and lower sums, Reimann Sums Definition, properties and existence of the Integral, The Fundamental Theorem of Calculus; Improper and Double Integrals

Infinite Series /Chapter 6 / 3.5 weeks
Basic Theory; Absolute Convergence, Power Series, Taylor Series.

Sequences and Series of Functions / Chapter 7 / 3 weeks
Uniform Convergence; Consequences of Uniform Convergence; Classic surprising examples.

Introduction to Differential Equations / Chapter 8 / 2 weeks
Elementary First Order Differential Equations, Existence and Uniqueness; Power Series Solutions

Preview of Grad-level Analysis; Introduction to Measure Theory /Royden Ch. 1/ 1 week
Open and Closed sets, Borel Sets; Countability and Completeness.

Tests and review: 1.5 weeks
total /14 weeks

EVALUATION

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

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