

SU DEPARTMENT OF MATHEMATICAL SCIENCES  
 SYLLABUS (*Tentative*)  
 MATH 452 *Analysis II*

**Objective:** To continue to develop the foundations for the analysis of real valued functions. The primary focus will be on proof. This course will lead students to a deeper understanding of Analysis, which is a fundamental area of mathematics.

**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 grades of C or better

**Text:** An Introduction to Analysis 2<sup>nd</sup> Edition by Bilodeau, Thie and Keough; Instructor's Notes and reserve text(s).

<b>Topics</b>	<b>Weeks</b>
<i>Review of Analysis I</i> (Chapters 1 - 4) Algebra of Sets, Functions and Mathematical Induction.	1.0
<i>Integration</i> (Chapter 5) The Reimann Integral; Properties; Existence; The Fundamental Theorem of Calculus, Improper Integrals. Optional: Double Integrals	3.0
<i>Infinite Series</i> (Chapter 6) Convergence of infinite series, tests for absolute and non-absolute convergence, Power series and Taylor Series. Taylor's Theorem.	4.0
<i>Sequences and Series of Functions</i> (Chapter 7) Pointwise and Uniform Convergence, Interchange of limits.	2.0
<i>The Topology of the Real Number System</i> (Reference material <sup>1</sup> ) Open and closed sets in $\mathbb{R}$ , compact sets, completeness, continuous functions, metric spaces.	2.0
<i>Advanced topics</i> (Instructor's notes) Banach and Hilbert Spaces, $L_p$ and $l_p$ spaces.	1.0
<i>Tests</i>	<u>1.0</u>
	14.0

**EVALUATION**

Portfolio	20% approx
Homework and Board Problems	30% approx
Midterm(s)	25% approx
Final	25% approx

\*\*Graduate students will complete longer, more involved portfolios and complete a term paper on some aspect of the history of analysis.

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<sup>1</sup> eg Chapter 10 of Bartle & Sherbert