**Real Analysis I and Linear Algebra I**

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Course Outcome for Real Analysis I and Linear Algebra I:

1. Define the Real number system, including basic ideas and the Archimedean property, demonstrating a clear understanding of the foundational concepts in real analysis.

2. Analyze and understand sequences of real numbers, including the definition, convergence, limit of a sequence, bounded and monotone sequences, and Cauchy sequences, applying these concepts to various properties and real-world applications.

3. Investigate series of real numbers, including the definition, convergence, and tests of convergence such as Comparison, Limit comparison, Ratio, Root, Rabbe's, Cauchy Condensation, Logarithmic, Integral tests, Abel's, and Dirichlet's tests, distinguishing between absolute and conditional convergence.

4. Evaluate limits of real-valued functions, including left-hand and right-hand limits, infinite limits, and limits at infinity, utilizing the sequential definition of limits and exploring the properties and applications of limits.

5. Analyze the continuity of real-valued functions, including definitions, left-hand and right-hand continuity, properties of continuous functions, and applications of the intermediate value property, identifying and analyzing discontinuous functions.

6. Examine the differentiability of real-valued functions, including the definition, properties, Chain rule, Rolle's theorem, and Lagrange's mean value theorem, applying these concepts to various real-world situations and applications.