MATHEMATICS 151A

ADVANCED CALCULUS I

Text: *Principles of Mathematical Analysis, Third Edition*, by W. Rudin

This is the first course in a three quarter sequence giving a rigorous development of mathematical analysis. Topics covered in the sequence include the real and complex number systems, sequences and series, continuity, differentiation, the Riemann-Stieltjes integral, sequences and series of functions, functions of several variables, and an introduction to Lebesgue integration.

TOPICS	SUGGESTED NO. OF 50 MIN. CLASSES

The real and complex number systems 4
(Ch. 1)

Axiomatic description of the real number system, the extended real numbers, the complex numbers, Euclidean spaces.

Point set theory in Euclidean spaces 4
(Ch. 2)

Finite, countable and uncountable sets, metric spaces, compact sets, perfect sets, connected sets.

Numerical sequences and series 5
(Ch. 3)

Convergent sequences, subsequences, Cauchy sequences, important examples, series of nnegative terms, tests for convergence, absolute convergence, addition and multiplication of series, rearrangements.

Continuity 3
(Ch. 4)

Limits of functions, continuity, continuous functions on compact sets, continuous functions on connected sets, discontinuities, monotonic functions, infinite limits and limits at infinity.

Differentiation 3
(Ch. 5)

The derivative, the Mean Value THeorem, continuity of derivatives, L'Hospital's Rule, higher order derivatives, Taylor's Theorem, vector valued functions.

The Riemann-Stieltjes integral 4
(Ch. 6)

Definition of the integral, conditions guaranteeing existence, properties of the integral, integration and differentiation, vector valued functions, rectifiable curves.