



MATHEMATICS 281 "HONOURS CALCULUS I"

Calendar Description: H(3-1T-1)

Limits and continuity; Differentiation of functions of one real variable; the Mean Value Theorem and its consequences; Riemann integration; fundamental theorem of calculus; applications.

Prerequisite: A grade of 80% or higher in Pure Mathematics 30 or equivalent; and 50% or higher in Mathematics 31.

Syllabus

<u>Topics</u>	<u>Number of Hours</u>
Review: Algebra and Functions, including Natural Logarithm	3
Limit, continuity	6
The derivative: Definition, Differentiability	1
Differentiation formulas: derivatives of power functions, trigonometric functions, exponential and logarithmic functions, rules for combining functions. Higher derivatives and implicit differentiation	4
The Mean Value Theorem, and consequences, including Inverse functions, Taylor's Theorem and the l'Hospitals Rule. Applications.	6
Inverse trigonometric functions, hyperbolic functions and their inverses.	3
Applications: Tangent lines, Linear Approximation, Extrema, Convexity	3
Antiderivatives and the indefinite integral, including the substitution rule.	3
Riemann integral: Definition and integrability, properties.	4
The Fundamental Theorem of Calculus. Applications, including areas.	3
TOTAL HOURS	36
