

Mathematics 275

Calculus For Engineers and Scientists

Calendar Description: H(3-1T-1.5)

Calculus of functions of one real variable; derivative and Riemann integral; Mean Value Theorem; the Fundamental Theorem of Calculus; techniques of integration; Applications; Improper integrals; Power series, Taylor series.

Prerequisite(s): A grade of 70 per cent or higher in Pure Mathematics 30 or Mathematics 30-1; and credit in Mathematics 31. Alternatively, admission to the Faculty of Engineering including credit in either Pure Mathematics 30 or Mathematics 30-1; and Mathematics 31.

Antirequisite(s): Credit for more than one of Mathematics 249 or 251 or 265 or 275 or 281 or Applied Mathematics 217 will not be allowed.

Syllabus

<u>Topics</u>	<u>Number of Hours</u>
Differentiation	11.5
Applications of differentiation	10
Integration: techniques and applications, Improper integrals	11.5
Infinite series, power series and Taylor series	4
TOTAL HOURS	37

See accompanying page for a detailed breakdown of instructional hours.

1. Differentiation and Applications :	
Review of limits and continuity (Done in Labs)	0.0 Hour
The derivative and tangent line	1.5 Hours
Differentiation Rules.	2.5 Hours
Higher Derivatives / Mean value Theorem	0.5 Hour
Implicit Differentiation.	0.5 Hour
Derivatives of Trigonometric Functions.	1.5 Hours
Derivative of Logarithmic and Exponential functions	2 Hours
The Inverse Trigonometric Functions.	2 Hours
Hyperbolic Functions.	1 Hour
Indeterminate Forms.	2 Hours
Vertical and Horizontal Asymptotes	1 Hour
Increasing and decreasing functions	1 Hour
Concavity and Inflection Points	1 Hour
Local Extrema	1 Hour
Extreme Value Problems.	2 Hours
Related Rates.	2 Hours
2. Integration and Applications	
Antiderivatives and initial value problems	1 Hour
Definite Integrals and properties / Fundamental Theorems.	1.5 Hours
Techniques of integration (All six)	7 Hours
Improper Integrals	1 Hour
Area of Plane Regions	1 Hour
3. Infinite Series	
Power series	2 Hours
Taylor Polynomials and Taylor 's Formula	1 Hour
Taylor and Maclaurin Series	1 Hour

Total: 37 Hours