Math 1001	CALCULUS-I	(CR3)
Preq.	FSc/A-Level (Math) or equivalent	

Objectives

The objective of this course is to acquaint students with the fundamental concepts of limit, continuity, differential and integral calculus of functions of one variable

Syllabus

Functions, limit of a function, graphical approach, properties of limits, theorems of limits, limits of polynomials, rational and transcendental functions, one-sided limits, continuity, derivatives of polynomials and rational, exponential, logarithmic and trigonometric functions, the chain rule, implicit differentiation, rates of change in natural and social sciences, related rates, linear approximations and differentials, higher derivatives, Leibnitz's theorem, applications of derivatives, increasing and decreasing functions, relative extrema and optimization. first derivative test for relative extrema, convexity and point of inflection, the second derivative test for extrema, curve sketching, mean value theorems, indeterminate forms and L'Hopitals rule, inverse functions and their derivatives, integration, anti-derivatives and integrals, Riemann sums and the definite integral, properties of Integral, the fundamental theorem of calculus, the substitution rules, Integrals of elementary, hyperbolic, trigonometric, logarithmic and exponential functions, integration by parts, substitution and partial fractions, approximate integration, improper integrals, Gamma functions, Applications (area between curves, average value, arc length, area of a surface of revolution), parameterized curves and polar coordinates, curves defined by parametric equations, calculus with parametric curves (tangents, areas, arc length), polar coordinates (polar curves, tangents to polar curves), areas and arc length in polar coordinates.

Recommended Books
1. *Calculus by Thomas (11th Edition), Addison Wesley (2005)*
2. *Calculus by H. Anton, I. Bevens, S. Davis (8th Edition), Wiley (2005)*
3. *Calculus Single and Multivariable by D. H. Hallett, A. M. Gleason, W. G. McCallum (3rd Edition) Wiley (2002)*
4. *Calculus and Analytics Geometry by C. H. Edward and E. D Penney, Prentice Hall (1988)*