



Calculus (1)

Course Code	Course Num.	Course Name	Credit Hours	Lec	Lab	Tut	Prerequisites
MAT	105	Calculus (1)	4	3	0	2	

Syllabus:

Limits and Continuity: Review Preliminaries; Concept of Limit. Computation of Limits; Continuity and its Consequences. Limits Involving Infinity.

Differentiation: The derivative, tangent lines and velocity Computation of Derivatives; The Power Rules; The Product and Quotient Rules; The Chain Rule; Implicit Differentiation; Derivatives of Inverse Functions; Derivatives of Exponential and Logarithmic Functions; Derivatives of Trigonometric and Inverse Trigonometric Functions.

Application of differentiation: First derivative test, Maximum and Minimum Values; Increasing and Decreasing Functions. Concavity and the Second Derivative Test; Overview of Curve Sketching. Linear approximation; Newton's method; Optimization.

Integral: Anti-derivatives; Indefinite Integral; Area. The Definite Integral; The Fundamental Theorem of Calculus; Area between curves. Indefinite Integral and Integration by Substitution, Area between curves. Volume: Slicing, Disks and Washers; Volumes by Cylindrical Shells. Arc Length; Area of Surface of Revolution.

References:

1. *Calculus Early Transcendental Function*, R. T. Smith and R. B. Minton, McGraw-Hill, 3rd edition. (**Main Reference**)
2. *Essential Calculus with Application*, Richard A. Silverman, Dover Publications.
3. *Calculus*, O. Swokowski, et al, PWS Pub. Co.; 6th edition (1994).
4. *Calculus Early Transcendentals*, C. Henry Edwards, David E. Penney, Prentice Hall, 2008.
5. *Schaum's Outline of Calculus*, Elliott Mendelson, Frank Ayres, McGraw-Hill, 1999.

