MA101 Mathematics I (3-1-0-8)

Prerequisite: Nil

Single variable Calculus: Convergence of sequences and series of real numbers; Continuity of functions; Differentiability, Rolle's theorem, mean value theorem, Taylor's theorem; Power series; Riemann integration, fundamental theorem of calculus, improper integrals; Application to length, area, volume and surface area of revolution.

Multivariable Calculus: Vector functions of one variable - continuity and differentiability; Scalar valued functions of several variables, continuity, partial derivatives, directional derivatives, gradient, differentiability, chain rule; Tangent planes and normals, maxima and minima, Lagrange multiplier method; Repeated and multiple integrals with applications to volume, surface area; Change of variables; Vector fields, line and surface integrals; Green's, Gauss' and Stokes' theorems and their applications.

Texts:

1. G. B. Thomas, Jr. and R. L. Finney, Calculus and Analytic Geometry, 9th Edition, Pearson Education India, 1996.

References:

1. R. G. Bartle and D. R. Sherbert, Introduction to Real Analysis, 3rd edition, Wiley India, 2005.
2. S. R. Ghorpade and B. V. Limaye, An Introduction to Calculus and Real Analysis, Springer India, 2006.
3. T. M. Apostol, Calculus, Volume-II, 2nd edition, Wiley India, 2003.
4. J. E. Marsden, A. J. Tromba and A.Weinstein, Basic Multivariable Calculus, Springer India, 2002.