SUBJECT NO-MA10001, SUBJECT NAME- Mathematics-I

LTP- 3-1-0,CRD- 4

SYLLABUS :-

Differential Calculus (Functions of one Variable): Rolle s theorem, Cauchy s mean value theorem (Lagrange s mean value theorem as a special case), Taylor s and Maclaurin s theorems with remainders, indeterminate forms, concavity and convexity of a curve, points of inflexion, asymptotes and curvature.

Differential Calculus (Functions of several variables): Limit, continuity and differentiability of functions of several variables, partial derivatives and their geometrical interpretation, differentials, derivatives of composite and implicit functions, derivatives of higher order and their commutativity, Euler s theorem on homogeneous functions, harmonic functions, Taylor s expansion of functions of several variables, maxima and minima of functions of several variables - Lagrange s method of multipliers.

Ordinary Differential Equations: First order differential equations - exact, linear and Bernoulli s form, second order differential equations with constant coefficients, method of variation of parameters, general linear differential equations with constant coefficients, Euler s equations, system of differential equations.

Sequences and Series : Sequences and their limits, convergence of series, comparison test, Ratio test, Root test, Absolute and conditional convergence, alternating series, Power series.

Complex Variables: Limit, continuity, differentiability and analyticity of functions, Cauchy-Riemann equations, line integrals in complex plane, Cauchy s integral theorem, independence of path, existence of indefinite integral, Cauchy s integral formula, derivatives of analytic functions, Taylor s series, Laurent s series, Zeros and singularities, Residue theorem, evaluation of real integrals.