SYLLABUS :-

1.Differential Calculus: Lagrange's mean value theorem, Cauchy's mean value theorem, Taylor's and Maclaurin's theorem. Functions of several variables: Limit, continuity, partial derivatives and their geometrical interpretation, total differential and differentiability, derivatives of composite and implicit functions, derivatives of higher order and their commutativity, Euler's theorem on homogeneous functions, Taylor's expansion of functions, maxima and minima, constrained maxima/minima problems using Lagrange's method of multipliers.2. Differential Equations: First order exact differential equations, general linear differential equations with constants coefficients, method of variation of parameters, Cauchy-Euler equations. Power series solutions of ODE's. 3. Integral Calculus: Improper integrals and tests for convergence, Beta and Gamma functions and their elementary properties. Differentiation under integral sign including variables limits-Leibnitz rule. Double and triple integrals, changing the order of integration, change of variables - Jacobian of a transformation, computation of surface area and volume.4. Vector Calculus: Definition of vector and scalar fields, level surfaces, limit, continuity, differentiability of vector functions. Directional derivative, gradient, curl, divergence and their geometrical interpretation. Line integral, path independence of line integrals, Green's theorem, surface integral, Gauss divergence theorem , Stokes theorem.