SYLLABUS :-

Linear Algebra: Algebra of matrices. Vector spaces - linear dependence of vectors, basis, linear transformations, rank and inverse of a matrix, solution of algebraic equations - consistency conditions, Hermitian, skew Hermitian and unitary matrices, bilinear forms, eigenvalues and eigenvectors. Numerical solution of system of linear equations â Gauss, Gauss-Jordan elimination and Gauss-Seidel iteration methods.

Integral Calculus: Fundamental theorem of integral calculus, mean value theorems, evaluation of definite integrals - reduction formulae. Convergence of improper integrals, tests of convergence, Beta and Gamma functions - elementary properties. Differentiation under integral sign, differentiation of integrals with variable limits - Leibnitz rule. Rectification, double and triple integrals, computations of area, surfaces and volumes, change of variables in double integrals - Jacobians of transformations, integrals dependent on parameters - applications.

Vector Calculus: Scalar and vector fields, level surfaces, directional derivative, Gradient, Curl, Divergence, Laplacian, line and surface integrals, theorems of Green, Gauss and Stokes, line integrals independent of path.

Numerical Analysis: Finite differences, Newtons forward and backward interpolation formulae, central difference interpolation formulae. Trapezoidal and Simpsons 1/3rd rules for numerical integration. Solution of polynomial and transcendental equations - bisection, Newton-Raphson and regula-falsi methods.