

Syllabus for M.Sc. Mathematics Entrance Test Examination 2025

Algebra: Groups, rings, fields, vector spaces, matrices, determinants, eigenvalues and eigenvectors, Cayley-Hamilton theorem.

Calculus: Limits, continuity, differentiability, sequences and series, multivariable calculus, maxima and minima, Taylor and Maclaurin series.

Real Analysis: Properties of real numbers, sequences and series, continuity, differentiability, Riemann integration, uniform convergence.

Complex Analysis: Analytic functions, Cauchy-Riemann equations, Cauchy's theorem and integral formula, residues and poles, Laurent series.

Linear Algebra: Vector spaces, linear transformations, inner product spaces, diagonalization, Gram-Schmidt process.

Differential Equations: First and second-order ODEs, linear differential equations with constant coefficients, systems of differential equations.

Numerical Methods: Numerical solutions of equations, interpolation, numerical integration and differentiation.

Topology (basic): Open and closed sets, compactness, connectedness, metric spaces.

Number Theory: Divisibility, congruences, Euler's theorem, Fermat's little theorem, Chinese Remainder Theorem.

Vector Calculus: Gradient, divergence, curl, line and surface integrals, Green's, Gauss's, and Stokes's theorems.