

Syllabus for M.S.(R) & Ph.D. Written test/ Interview – January 2026 semester

Department of Mechanical Engineering - Solid Mechanics and Design

Engineering mathematics and fundamentals from the UG/ PG coursework and project work relevant to Solid Mechanics and Design.

Linear Algebra: Algebra of matrices; Inverse and rank of a matrix; System of linear equations; Symmetric, skew-symmetric and orthogonal matrices; Determinants; Eigenvalues and eigenvectors; Diagonalisation of matrices; Cayley-Hamilton Theorem.

Calculus: Functions of single variable, limit, continuity and differentiability, mean value theorems, indeterminate forms; partial derivatives, total derivative, Taylor series (in one and two variables), maxima and minima. Evaluation of definite and indefinite integrals; Applications of integrals to evaluate areas and volumes, Double and triple integrals, and their applications.

Vector Calculus: Gradient, divergence, and curl; applications of these concepts in engineering analyses.

Ordinary Differential Equations: First-order equations (linear and nonlinear); Second-order linear differential equations with variable coefficients.

General aptitude.