

Bridge Course Syllabus for Engineering Mathematics

Unit I Matrices, Vector Algebra and Partial Fractions

Basic needs of matrices - Physical interpretation of matrices - Types of matrices - Operations on matrices.

Properties of matrices - Determinants - Relation between matrices and determinants - Properties of determinants.

Representation of vectors - Physical interpretation of vectors - Types of vectors - Operation on vectors - Direction ratios and direction cosines.

Applications of partial fractions - Importance of partial fractions - Types.

Unit II Series & Sequence and Trigonometric Functions

Importance of series and sequences - Link between series and sequences - Validity of series - Conditions for convergence and divergence.

Binomial series - Exponential series – Logarithmic series.

Angles - Measurements - Degrees - Radians - Quadrants - Trigonometric ratios - Ratios of particular angles.

Unit III Differential Calculus

Limits and continuity - Concepts of continuity - Derivatives of a function - Differentiation rules - Derivatives of trigonometric function.

Chain rule - Techniques of differentiation - Total and partial derivatives.

Theory of equations - Relation between roots and coefficients - Expressions - Equations and factors.

Unit IV Integral Calculus

Applications of integration - Definite and indefinite integrals - Proper and improper integrals - Techniques of integration.

Integration by substitution - Integration by parts - Bernaulli's formula - Integration by using partial fractions.

Unit V Differential Equations

ODE - PDE - Applications of ODE & PDE - Formation of ODE & PDE.

Order - Degree - Need of differential equations & importance.

Linear & non linear - Homogeneous & non homogeneous equations.

Relation between constant coefficients & variable coefficients.