

SESSION 2024-25
B. Tech 1st Year (Odd Sem)
Course Outcomes (COs) & Syllabus

Academic Year	Year/Semester	Course Name	Course Code
2024-25	I / I	Engineering Mathematics-I	BAS103
CO	Course Outcome (CO)		
CO 1	<i>Understand</i> the concept of complex matrices, Eigen values, Eigen vectors and <i>apply</i> the concept of rank to <i>evaluate</i> linear simultaneous equations.		
CO 2	<i>Remember</i> the concept of differentiation to <i>find</i> successive differentiation, Leibnitz Theorem, and <i>create</i> curve tracing, and <i>find</i> partial and total derivatives.		
CO 3	<i>Applying</i> the concept of partial differentiation to <i>evaluate</i> extrema, series expansion, error approximation of functions and Jacobians.		
CO 4	<i>Remember</i> the concept of Beta and Gamma function; <i>analyze</i> area and volume and Dirichlet's theorem in multiple integral.		
CO 5	<i>Apply</i> the concept of Vector Calculus to <i>analyze</i> and <i>evaluate</i> directional derivative, line, surface and volume integrals.		

UNIT	SYLLABUS
1	Matrices: Elementary transformations, Inverse of a matrix, Rank of matrix, Solution of system of linear equations, Characteristic equation, Cayley-Hamilton Theorem and its application, Linear Dependence and Independence of vectors, Eigen values and Eigen vectors, Complex Matrices, Hermitian, Skew-Hermitian and Unitary Matrices, Applications to Engineering problems.
2	Differential Calculus- I: Successive Differentiation (nth order derivatives), Leibnitz theorem, Curve tracing, Partial derivatives, Euler's Theorem for homogeneous functions, Total derivative.
3	Differential Calculus-II: Expansion of functions by Taylor's and Maclaurin's theorems for functions of one and two variables, Maxima and Minima of functions of several variables, Lagrange's method of multipliers, Jacobians, Approximation of errors.
4	Multiple Integration: Double integral, Triple integral, Change of order of integration, Change of variables, Beta and Gama function and their properties, Dirichlet's integral and its applications to area and volume, Liouville's extensions of Dirichlet's integral.
5	Vector Calculus: Vector differentiation: Gradient, Curl and Divergence and their Physical interpretation, Directional derivatives. Vector Integration: Line integral, Surface integral, Volume integral, Gauss's Divergence theorem, Green's theorem and Stoke's theorem (without proof) and their applications.