

SYLLABUS

ENGINEERING MATHEMATICS-III

UNIT-I: Ordinary differential equations: Complete solution, Operator D, Rules for finding complementary function, the inverse operator, Rules for finding the particular integral, Method of variation of parameters, Cauchy's and Legendre's linear differential equations.

UNIT-II: Laplace Transform: Definition, standard forms, properties of Laplace transform, inverse Laplace transform, Initial and final value theorem, Convolution theorem, Laplace transform of impulse function, Unit step function, Laplace transforms of periodic function.

UNIT-III: a) Applications of Laplace Transform: Solution of Linear differential equations, Simultaneous differential equation by Laplace transform method. **b) Fourier Transform:** Definition, standard forms, Fourier transforms, properties of Fourier transforms, Convolution theorem, Fourier sine and Fourier cosine transforms and integrals, inverse Fourier transforms.

UNIT-IV: a) Partial differential equation of first order of following form:- (i) $f(p, q) = 0$; (ii) $f(p, q, z) = 0$; (iii) $f(x, p) = g(y, q)$; (iv) $Pp + Qq = R$ (Lagranges Form); (v) $z = px + qy + f(p, q)$ (Clairauts form). **b) Statistics** Curve fitting: Least Square Method, Coefficient of Correlations, Lines of Regression.

UNIT-V: Complex Analysis: Functions of complex variables, Analytic function, Cauchy- conditions, Harmonic function, Harmonic conjugate functions, Milne's Method, conformal mappings (translation, rotation, magnification and bilinear transformation), Expansion of function in Taylor's and Laurent's series.

UNIT-VI: Vector Calculus: Scalar and vector point functions, Differentiation of vectors, Curves in space, Gradient of a scalar point function, Directional derivatives, Divergence and curl of a vector point function and their physical meaning, expansion Formulae (without proof), line, surface, volume integrals, irrotational Solenoidal Vector fields.