Content Product
Detailed syllabus
TRANSFORM AND PARTIAL DIFFERENTIAL EQUATIONS

UNIT I - PARTIAL DIFFERENTIAL EQUATIONS

Introduction to formation of Partial Differential Equations- Formation of Partial Differential Equations, Example problems. **Elimination Of Arbitrary Functions** - Example problems**. Solutions of standard types of first order partial differential equations** - Singular integral, Type – I: f(p,q) = 0, Type II: Clairaut's form, Type III(a): F(z, p, q) = 0, Type III(b): f(x, p, q) = 0, Type III(c): f(y, p, q) = 0, Type IV: f(x, y, p, q) = 0. Type V: f (x^m, y^nq, z) = 0, Type VI: f(zmp, znq) = 0, Example problems. **First order linear (lagrange) equation** - Solution of a Partial Differential Equation, Linear Partial differential equations of the first order, Example problems. **Higher order partial differential equations** - Example problems. **Complementary function for a non-homogeneous linear equation** - Example problems.

UNIT II - FOURIER SERIES

Fourier series- History of Fourier Series, Periodic Function, Dirichlet Conditions, Determination of Fourier Coefficients, Euler's Formula, Example problems. **Function having points of discontinuity** - Example problems. **Even and odd functions** - Example problems. **Half range fourier series** - Example problems. **Complex form** - Example problems. **Parseval's Theorem** - Example problems. **Harmonic analysis** - Example problems.

UNIT III - APPLICATIONS OF PARTIAL DIFFERENTIAL EQUATIONS

Applications of partial differential equations - Transverse vibrations of a stretched string one dimensional wave equation, Transmission line equations, Variable separable solutions of the wave, Choice of proper solution, Solution of a damped vibrating string equation, Problems on vibrating string with non-zero initial velocity, Example problems. **One dimensional heat flow** - Equation of variable heat flow in one dimension, Variable separable solutions of the heat equation, Choice of proper solution, One dimensional heat equation, Example problems. **Steady state heat flow two dimensions [Cartesian Coordinates]** - Equation of variable heat flow in two dimensions in cartesian coordinates, Variable separable solutions of laplace equation, Choice of proper solution, Two dimensional heat equation, Example problems.

UNIT IV - FOURIER TRANSFORMS

Fourier integral theorem - Integral transforms, Example problems. **Fourier sine and cosine integral**- Example problems. **Fourier transform pair** - Complex fourier transforms and its inversion formula, Properties, Example problems. **Fourier sine transform** - Example problems. **Fourier cosine transform**- Example problems.

UNIT V - Z TRANSFORMS

Z-Transform - Definition of Z-Transform, Problems based on bilateral Z-transform, Example problems.

Linear Property- Example problems. **Shifting and Damping rule** - Example problems. **Differentiation in the z-domain** - Example problems. **Second shifting theorem** - Example problems. **Unit sample sequence and unit step sequence** - Example problems. **Initial and final value theorems** - Differentiation, Example problems. **Inverse Z-Transform** - Partial Fractions Method, Inverse integral method (Cauchy's residue theorem), Example problems. **Convolution Theorem** - Z-transform of f(x)*g(x)type, Example problems. **Formation of difference equations** - Example problems. **Solution of difference equations using Z - transform** - Example problems.