SYLLABUS

INTEGRAL TRANSFORMS AND THEIR APPLICATIONS

UNIT – I

Laplace Transforms : Definition and examples, Existence theorem and basic properties, Convolution theorem and properties of convolution, Differentiation and Integration of Laplace transform, the inverse Laplace transform and examples. Tauberian theorems for Laplace transforms and Watson's Lemma, Laplace transforms of fractional integrals and fractional derivatives.

Applications of Laplace Transform to Solve/Evaluate : Ordinary and partial differential equations, Initial and boundary value problems, Integral equations, Definite integrals, Difference equations and Differential-difference equations.

Finite Laplace Transforms : Definition and examples, Basic operational properties, Applications, Tauberian theorems for finite Laplace transforms.

Hankel Transforms : Definition and examples, operational properties, Applications to solve partial differential equations.

UNIT – II

Fourier Transforms : Fourier Integral formulas, Definition and examples, Basic properties, Fourier cosine and sine transforms and examples, Basic properties of Fourier cosine and sine transforms, Multiple Fourier transforms.

Applications of Fourier Transform to Solve/Evaluate : Ordinary and Partial differential equations, Integral equations, Definite integrals. Applications of Multiple Fourier transform.

Finite Fourier Cosine and Sine Transforms : Definition and examples, Basic properties, Applications, Multiple finite Fourier transforms and their applications.

Mellin Transforms : Definition and examples, Basic operational properties and Applications.