

Govt. College for Women, Shahzadpur (Ambala)
Lesson Plan(2023-24 Even)

Faculty Name: Aarti Saini and Natasha
Paper Name: Special Functions and Integral Transforms
Class : B.Sc IV th sem
External Marks: 40

Paper Code: BM-242
Semester: IV
Session: Even
Internal Marks:10

Course Objectives

- * To introduce the students with the concepts of Laplace Transforms and their applications in solving ordinary differential equations.
- * To introduce the students with series , Legendre and Hermite's solutions of differential equations
- * To understand the basic concepts of Integral Transforms and their applications in problem solving and life- long learning

Course Outcome

At the end of the course, student will have:

- * the knowledge of Power Series, analytic functions.
- *will be able to solve the differential equations based on series method,
- * will be able to solve Bessel equations, Legendre and Hermite's equations and able to apply their applications to solve the problems of convergence
- * students will have the knowledge of Laplace Transforms of derivatives and integrals, Relation between Fourier Transform and Laplace transform

Month	Dates	Topics To be Covered	Assignment/ Test/ others
January	1Jan- 6Jan	Laplace Transforms – Existence theorem for Laplace transforms, Linearity of the Laplace transforms, Shifting theorems	
	8Jan- 13Jan	Laplace transforms of derivatives and integrals, Differentiation and integration of Laplace transforms	Test
	15Jan- 20Jan	Convolution theorem, Inverse Laplace transforms, convolution theorem, Inverse Laplace transforms of derivatives and integrals	
	22 Jan- 27 Jan	solution of ordinary differential equations using Laplace transform	
	29 Jan - 31 Jan	Series solution of differential equations – Power series method	Assignment
February	1 Feb -03 Feb	Series solution of differential equations – Power series method	Test
	5 Feb - 10 Feb	Definitions of Beta and Gamma functions. Bessel equation and its solution	
	12 Feb - 17 Feb	Bessel functions and their properties-	Assignment
	19 Feb - 24 Feb	Convergence, recurrence, Relations and generating functions, Orthogonality of Bessel functions.	Test
	26 Feb - 29 Feb	Legendre and Hermite differentials equations and their solutions	
March	1 March - 9 March	Legendre and Hermite functions and their properties-Recurrence Relations and generating functions.	Test
	11 March - 16 March		
	18 March -22 March	Orthogonality of Legendre and Hermite polynomials, Rodrigues' Formula for Legendre & Hermite Polynomials,	Test
April	1 April- 6 April	Laplace Integral Representation of Legendre polynomial. Fourier transforms: Linearity property	
	8 April- 13 April	Shifting, Modulation, Convolution	Test
	15 April- 20 April	Theorem	
	22 April - 30 April	Fourier Transform of Derivatives, Relations between Fourier transform	Test

Signature of Teacher