20BSM309T- Integral Transform

Teaching Scheme					Examination Scheme					
L	T	P	C	Hrs/Week	Theory			Practical		TotalMarks
					MS	ES	IA	LW	LE/Viva	
3	1	--	4	4	25	50	25	--	--	100

OBJECTIVES

1. Calculate the Laplace and Fourier transforms of standard functions both from the definition and by using tables.
2. Calculate both real and complex forms of the Fourier series for standard periodic waveforms and convert from real-form Fourier series to complex-form and vice-versa.
3. Demonstrate their understanding of the Dirichlet conditions by using them to evaluate infinite series.
4. Recognize even and odd functions and use the resulting simplifications for Fourier series and transforms.
5. Expose the basic properties of integral transforms and their applications in science and engineering problems.

SYLLABUS

Unit I	**10**

Laplace Transforms: Definition, Existence conditions and basic properties of Laplace transforms, The Convolution theorem and its properties, Differentiation and integration of Laplace transforms, Inverse Laplace Transforms.

UNIT II	**10**

Applications of Laplace Transforms: Solution of ODE's, PDE's, Initial and boundary value problems, Evaluation of Definite Integrals, Application of Joint Laplace and Fourier Transforms.

UNIT III	**9**

Solution of one dimensional heat and wave equations and Laplace equation by integral transform Method (Laplace and Fourier transform)

UNIT IV	**10**

Fourier Transforms and their applications: The Fourier Integral formulas, Definition of Fourier transforms, Fourier transforms of generalized Functions, Basic properties of Fourier transforms, Fourier Cosine and Sine Transforms, It's application to PDE's, Evaluation of Definite Integrals.

APPROXIMATE TOTAL	**39 Hours**

COURSE OUTCOMES

1. Able to deal with problems in applied mathematics in science and engineering.
2. Able to apply integral transforms to boundary and initial value problems in ODE's and PDE's.
3. Able to Present his/her calculations in a manner that is readily intelligible.
4. Able to approach more advanced aspects of transform methods.

TEXTS AND REFERENCES

1. Lokenath Debnath, Dambaru Bhatta, Integral Transforms and Their Applications.(Second Edition), Chapman & Hall/CRC (Taylor & Francis)
2. Davies, Brian, Integral Transforms and Their Applications.(Third Edition), Springer-Verlag New York.
3. Integral Transforms of Generalized Functions, Yu. A. Brychov and A. P. Prudnikov.