

MUFFAKHAM JAH COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC Autonomous Institution)

Course Code	Course Title					Core/Elective	
25BS213MT	TRANSFORMATION TECHNIQUES AND STATISTICS Branch: B.E. (Mechanical)					Core	
Prerequisite	Contact hours per week				CIE	SEE	Credits
MDC, DENM	L	T	D	P	40	60	3
	3	0	0	0			

Course Objectives: To learn

1. Perform Fourier series for a given range.
2. Perform Fourier sine and cosine transformations.
3. Understand the one dimensional wave equation, heat equation.
4. Understand fundamental concepts of probability theory and random variables.
5. Analyze statistical data using sampling distributions.

Course Outcomes: After learning the contents of this course, the student must be able to

1. Obtain the Fourier series for a given function.
2. Obtain the Fourier sine and cosine transformations.
3. Determine the solution of a wave and heat equations by the method of separation of variables.
4. Evaluate statistical parameters of discrete and continuous probability distributions.
5. Testing of hypothesis of few unknown statistical parameters using types of sampling, Sampling distribution of means.

Unit-I: Fourier Series: Even and Odd functions, Dirichlet's conditions, Expansion of a function for a given range $(0, 2\pi)$, $(-\pi, \pi)$, $(0, 2l)$, $(-l, l)$, Half-range sine and cosine series.

Unit-II: Fourier Transforms: - Fourier transformation - sine, cosine transformations - simple illustrations.

Unit-III: Applications of Partial Differential Equations: Second order linear Partial Differential Equation and their classification, Method of separation of variables, vibrations of stretched string wave equation, one-dimensional heat equation, Laplace equation.

Unit-IV: Probability: Review of fundamental concepts of probability, Discrete and continuous distributions, Poisson, and Normal distributions.

Unit-V: Statistics: Hypothesis testing, comparison of single mean to specified value and comparison of equality of two means, Chi-square test for goodness of fit.

Text Books:

1. B. S. Grewal, Higher Engineering Mathematics, Khanna Publication 43rd Edition, 2014.
2. R. K Jain, S.R.K Iyengar, Advanced Engineering Mathematics, Narosa Publication. 4Th Edition, 2014.
3. M.D.Rai Singhania, Ordinary and Partial Differential Equations, S.Chand and Co., 2024, 20th Edition.
