

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

Course Code	Course Title						Core/Elective
25BS211MT	PROBABILITY AND STATISTICS Branches: B.E. (CSE (DS), CSE (AI) & CSE (AI&ML))						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. Understand fundamental concepts of probability theory and random variables.
2. Apply discrete and continuous probability distributions in engineering problems.
3. Analyze statistical data using sampling distributions.
4. Perform hypothesis testing for means, proportions and variances.
5. Apply correlation, regression and basic statistical tools in real-life engineering applications.

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

1. Solve problems involving probability axioms, conditional probability and Bayes' theorem
2. Evaluate statistical parameters of discrete probability distribution.
3. Evaluate statistical parameters of continuous probability distribution.
4. Perform regression analysis to compute the coefficient of correlation to interpret data.
5. Testing of hypothesis of few unknown statistical parameters using types of sampling, Sampling distribution of means, Sampling distribution of variance.

Unit-I: Probability: Introduction, Conditional Probability, Baye's Theorem (Without proof), Random variable, Discrete Probability Distribution, Continuous Probability Distribution, Probability Mass Function, Probability Density Function, Expectation, Variance.

Unit-II: Discrete Probability Distributions: Binomial Distribution and Poisson Distributions- Evaluation of Statistical Parameters for these Distributions- Mean, Variance and Moment Generating Function.

Unit-III: Continuous Probability Distributions: Uniform Distribution, Exponential Distribution and Normal Distribution- Evaluation of Statistical Parameters for these Distributions-Mean, Variance and Moment Generating Function.

Unit-IV: Curve Fitting: Curve Fitting by the Method of Least Squares-Fitting of Straight Line, Fitting of Parabola, Fitting of other Curves ($y = ae^{bx}$, $y = ax^b$, $y = ab^x$), Coefficient of Correlation, Regression Coefficient, Lines of Regression, Rank Correlation Coefficient.

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Unit-V: Test of Significance -Large samples- Test for single mean, difference of means, single proportion, difference of proportions -Test of significance for small samples- chi-square test for goodness of fit and independence of attributes, student's t-test, F -test for ratio of variances.

Suggested Reading:

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. S.C Gupta and V.K Kapoor, Fundamental of Mathematical Statistics, Sultan Chand & sons, New Delhi, 2014.

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