

PROBABILITY AND STATISTICS

Credits	Periods			Exam Hrs.	Sessional Marks	Exam Marks	Total Marks
	Theory	Tutorial	Lab				
3	3	1	-	3	40	60	100

Course Objective: Purpose to develop a thorough understanding of the methods of probability and statistics which are used to model engineering problems.

Course Outcomes :

By the end of the course, the student will be able to:	
1	Demonstrate the understanding of basic probability axioms and rules and baye's theorem.
2	Explain various concepts of discrete and continuous random variables and calculate moments about origin and mean, conditional expected values.
3	Examine, analyze, and compare Probability distributions.
4	Discuss basic ideas of linear regression and correlation, create and interpret a line of best fit, calculate and interpret the correlation coefficient.
5	Prepare null and alternative hypothesis and test its validity based on random samples.

UNIT-I: PROBABILITY

[12 Periods]

Probability: Classical, relative frequency and axiomatic definitions of probability, addition rule and conditional probability, multiplication rule, total probability, Baye's theorem and independence.

UNIT II: RANDOM VARIABLES

[12 Periods]

Random variables: Discrete, continuous and mixed random variables, probability mass, probability density and cumulative distribution functions, mathematical expectation, moments, moment generating function, chebyshev's inequality.

UNIT III : PROBABILITY DISTRIBUTIONS

[10 Periods]

Binomial Distribution, Mean , Variance and Standard Deviations of Binomial Distribution, Poisson distribution,
 Mean , Variance and Standard Deviations of Poisson Distribution, Normal Distribution and their properties ,
 Gamma Distribution (All without Proofs).

UNIT IV: CORRELATION & REGRESSION

[12 Periods]

Correlation, Linear Correlation, Correlation Coefficient, Properties of correlation coefficients, Rank correlation coefficients. Regression, Equation of the Regression line of Y on X, Equation of Regression line of X on Y, Standard error of estimate

UNIT – V: SAMPLING THEORY

[14 Periods]

Formulation of Null Hypothesis, Critical Region, Level of Significance. Large samples Test of Significance of Large Samples – Single Proportion, Difference between two Proportions, Single mean and Difference of means. Small Samples Students t - distribution (Significance test of a

sample mean, Significance test of difference between sample means), F- distribution, χ^2 - test, Goodness of fit.

TEXT BOOK:

Dr. B.S. Grewal, Higher Engineering Mathematics, 43rd Edition, Khanna Publishers, New Delhi, 2014.

REFERENCE BOOKS:

1. Kishor S. Trivedi, Probability & Statistics with Reliability, Queuing and Computer Applications, Prentice Hall of India, 1999.
2. Richards A. Johnson, Miller & Freund's Probability & Statistics for Engineers, Sixth Edition Prentice Hall of India, 2004.
3. Vijay K. Rohatgi, A.K.Md.Ehsanes Saleh, An Introduction to Probability and Statistics, 3rd Edition by, Wiley Series.
4. T.Veerarajan, Probability, Statistics and Random Processes, Tata McGraw Hill Publications.