

CORE COURSES XVII - PROBABILITY AND STATISTICS

Unit I

Probability: Definitions of probability, Addition theorem, Conditional probability, Multiplication theorem, Bayes theorem of probability and Geometric probability. Random variables and their properties, Discrete Random variable, Continuous Random variable, Probability Distribution joint probability distributions their properties, Transformation variables, Mathematical expectations, probability generating functions

Unit II

Probability Distributions / Discrete distributions: Binomial, Poisson Negative binominal distributions and their properties. (Definition, mean, variance, moment generating function. Additive properties, fitting of the distribution.) Continuous distributions: Uniform, Normal, exponential distributions and their properties. Curve fitting using Principle of Least Squares.

Unit III

Multivariate Analysis: Correlation, correlation coefficient, Rank correlation, Regression Analysis, Multiple Regression, Attributes, coefficient of Association, χ^2 – test for goodness of fit, test for independence.

Unit IV

Sample, populations, statistic, parameter, Sampling distribution, standard error, unbiasedness, efficiency, Maximum likelihood estimator, notion & interval estimation. Testing of Hypothesis: Formulation of Null hypothesis, critical region, level of significance, power of the test.

Unit V

Queuing theory: Queue description, characteristics of a queuing model, study state solutions of M/M/1: α Model, M/M/1; N Model.

Text book:

1. T.Veerarajan , “Probability, Statistics and Random Processes” , Tata McGraw Hill

Reference Book:

2. Kishor S. Trivedi, “Probability & Statistics with Reliability, Queuing and Computer Applications”, Prentice Hall of India, 1999