

**SREENIVASA INSTITUTE OF TECHNOLOGY AND MANAGEMENT STUDIES
(Autonomous)**

I MCA- II Semester

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16HAS121 PROBABILITY AND STATISTICS

Course Objectives

- Explain simple unconditional probabilities and conditional probabilities
- Define the probability mass function of a discrete random variable and the binomial distribution
- Define the probability density function of a continuous random variable and the normal distribution
- Define the expectation of a function of a random variable
- Define critical values
- Derive confidence intervals for population parameters
- Derive hypothesis tests for population parameters
- Derive the Chi - Square Test of Independence for a contingency table
- Derive the linear regression parameter estimates and correlation coefficient

Syllabus:

UNIT I : Probability and Random variables

Probability: Sample space and events - Probability - The axioms of probability - Some elementary theorems - Conditional probability - Baye's theorem.

Random variables: Discrete and continuous distributions - Distribution functions.

UNIT II : Probability Distributions

Binomial - Poisson and Normal distributions - Related properties.

UNIT III : Sampling distribution and Estimation

Sampling distribution: Populations and samples - Sampling distributions of mean (known and unknown) - Proportions - Sums and differences.

Estimation: Point estimation - Interval estimation - Bayesian estimation.

UNIT IV : Test of Hypothesis and Test of Significance

Test of Hypothesis: Means - Hypothesis concerning one and two means - Type I and Type II errors - One tail, two-tail tests.

Test of Significance: Student's t-test - F-test - Chi-square test of goodness of fit.

UNIT V : Curve fitting & ANNOVA

Curve fitting: The method of least squares – Linear, Parabola, Exponential and Power form.

ANNOVA: ANNOVA for one-way and two-way classification data.

Course Outcomes:

- Calculate a simple unconditional probability and conditional probability
- Calculate a probability from a probability mass function of a discrete random variable and a binomial distribution
- Calculate a probability from a probability density function of a continuous random variable and a normal distribution
- Calculate an expectation of a random variable for a given distribution
- Calculate a critical value from a normal, t, chi - square, and f distribution
- Calculate an appropriate confidence interval for a population parameter for a given data set
- Perform an appropriate hypothesis tests for a population parameter for a given data set
- Perform a Chi - Square Test of Independence for a contingency table
- Calculate a linear regression for a given data set

TEXT BOOKS:

1. Fundamentals of Mathematical Statistics, 10/e, 2001, S.C. Gupta, V.K. Kapoor, S. Chand and Company Publishers, New Delhi.
2. Probability and Statistics, 2012, T.K.V. Iyengar, B. Krishna Gandhi, S. Ranganatham and M.V.S.S.N. Prasad , S. Chand and Company Publishers, New Delhi.

REFERENCE BOOKS:

1. Probability and Statistics, 2011, V. Ravindranath, T.S.R. Murthy, I.K. International Pvt. Ltd, New Delhi.
2. Probability and Statistics for Engineers, 6/e, 2006, Johnson A. Richard, Miler & Fruends, Pearson Education, New Delhi.
3. Higher Engineering Mathematics, 34/e, 1999, Dr. B. S. Grewal, Khanna Publishers, Delhi
4. Probability and Statistics for Engineers, 2011, Dr. J. Ravichandran, Wiley-India Publishers, New Delhi.
5. Probability and Statistics for Engineers and Scientists, 7/e, 2002, Ronald E. Walpole, Raymond H. Myers, Sharon L. Myers, Keying Ye, Pearson Education Asia, New Delhi.

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