PROBABILITY AND STATISTICS
(Basic Science Elective)

Course Code:15BM1105

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Pre requisites:

1. Fundamentals of Set theory.
2. Basic concepts of Probability.
3. Basic concepts of calculus.

Course Outcomes:

At the end of the Course, Student will be able to:

CO 1 Determine the cumulative distribution function, mean and variance of discrete and continuous random variables.

CO 2 Calculate probabilities using normal distribution and describe sampling distribution of means.

CO 3 Describe and compute confidence intervals for the mean of a population. Prepare null and alternative hypothesis concerning single mean and test its validity based on random samples.

CO 4 Prepare null and alternative hypothesis concerning two means, proportions and variances and test its validity based on random samples Determine linear and nonlinear regression for the given data.

CO 5 Calculate correlation coefficient for the given bi variate data.

UNIT-I **(10 Lectures)**

Random Variables: Discrete Random variables, Mean and variance of a Probability distribution, Continuous Random variables.

(4.1, 4.4, 5.1)

UNIT-II **(10 Lectures)**

Normal Distribution: Calculating Normal Probabilities, Normal

Approximation to Binomial Distribution.

Sampling Distributions: Population and sample, Sampling distribution of the mean (s known), Sampling distribution of the mean (s unknown),

(5.2, 5.3, 6.1, 6.2, 6.3)

UNIT-III (10 Lectures)

Estimation: Point Estimation, Interval Estimation (Large sample and small sample).

Tests of Hypothesis: Introduction to Test of Hypotheses, Hypotheses concerning one mean

(7.1, 7.2, 7.4, 7.5, 7.6)

UNIT-IV (10 Lectures)

TESTS OF HYPOTHESIS:

Experimental design for comparing two treatments. Comparisons – two independent large samples, two independent small samples, Matched pair comparisons.

Estimation of Variances (point and Interval estimation), Hypotheses concerning one variance, Hypotheses concerning two variance.

Estimation of Proportions, Hypotheses concerning one Proportion, Hypotheses concerning several Proportions.

(8.1 - 8.4, 9.1- 9.3, 10.1 – 10.3)

UNIT-V (10 Lectures)

Regression analysis: The method of least squares, curvilinear regression, multiple regressions, correlation (excluding causation).

(11.1, 11.3, 11.4, 11.6)

TEXT BOOK:

Richard A.Johnson, “Miller.& Freund’s Probability and Statistics for Engineers”, eighth edition, PHI Learning India Private Limited, 2011.

REFERENCE BOOK:

S.C. Gupta and V.K. Kapoor, “Fundamentals of Mathematical Statistics”, Ninth Revised Edition , Sultan Chand & Sons Educational Publishers, 2007.