ACE R25- BoS Approved Syllabus

PROBABILITY AND STATISTICS (MA301BS)

B.Tech. II Year I Sem. CE **L T P C**

Pre-requisites: Mathematics courses of first year of study. **3 0 0 3**

Course Objectives: To learn

1. The theory of Random Variable, and probability distributions of single random variables.
2. The sampling theory and testing of hypothesis and making statistical inferences.
3. The curve fitting, correlation and regression for the given data.

Course outcomes: After learning the contents of this paper, the student must be able to

1. Apply the concepts of Random variable and distributions to some case studies.
2. Correlate the concepts of one unit to the concepts in other units.
3. Understood sampling theory and apply hypothesis testing in real-world scenarios
4. Fit the curve, correlation, and regression for the given data.

UNIT-I: Random Variables and Probability Distributions
Concept of a Random Variable – Discrete Probability Distributions – Continuous Probability Distributions – Mean of a Random Variable – Variance of a Random Variable Discrete Probability Distributions: Binomial Distribution – Poisson distribution

UNIT-II: Continuous Distributions and Sampling
Uniform Distribution – Normal Distribution – Areas under the Normal Curve – Applications of the Normal Distribution – Normal Approximation to the Binomial Distributions. Fundamental Sampling Distributions: Random Sampling – Some Important Statistics – Sampling Distributions – Sampling Distribution of Means – Central Limit Theorem.

UNIT-III: Estimation
Introduction – Statistical Inference – Classical Methods of Estimation – Single Sample: Estimating the mean – Standard error of a point Estimate. Two samples: Estimating the difference between two means– Single sample: Estimating a proportion – Two samples: Estimating the difference between two proportions– Two samples: Estimating the ratio of two variances.

UNIT-IV: Tests of Hypotheses (Large and Small Samples)
Statistical Hypotheses: General Concepts – Testing a Statistical Hypothesis. Single sample: Tests concerning a single mean. Two samples: Tests on two mean (Unknown for equal variance). One sample: Test on a single proportion. Two samples: Tests on two proportions. Two- sample tests concerning variances: F-distribution

UNIT-V: Applied Statistics
Curve fitting by the method of least squares – Fitting of straight lines – Second degree parabolas and more general curves. Correlation and Regression – Rank correlation.

TEXT BOOKS

1. Ronald E. Walpole, Raymond H. Myers, Sharon L. Myers, Keying Ye, Probability & Statistics for Engineers & Scientists, 9th Ed. Pearson Publishers.
2. S C Gupta and V K Kapoor, Fundamentals of Mathematical statistics, Khanna publications.
3. S D Sharma, Operations Research, Kedarnath and Ramnath Publishers, Meerut, Delhi

REFERENCE BOOKS

1. T.T. Soong, Fundamentals of Probability and Statistics for Engineers, John Wiley & Sons, Ltd, 2004.
2. Sheldon M Ross, Probability and Statistics for Engineers and Scientists, academic press
3. Miller and Freund's, Probability and Statistics for Engineers, 8th Edition, Pearson Educations 2002