STATISTICS & PROBABILITY FOR ENGINEERS(GS-201)

Pre-requisite: None Credit Hours: 02 Contact Hours: 32

RECOMMENDED BOOK(S)

Miller & Freund's Probability and Statistics for Engineers by R.A. Johnson, 7th Edition

REFERENCE BOOK(S)

Probability and Statistics (Jay L Devore) 7th Edition
Probability & Statistics for Engineering & Sciences (William W. Hines, Douglas C. Montgomery)
Introductory Statistics (Neil A Weiss) 4th Edition
Introduction to Probability and Statistics (J S Milton, J. C. Atnold)
Probabilities, Random Variables, & Random Processes Michel O'Flynn.

COURSE OBJECTIVES

The course will provide knowledge and skills for the students to apply statistical techniques to complex engineering problems 2. This course will provide knowledge regarding Probability Theory, Random Variables, Distributions and Estimation, emphasizing the link between Statistics and Engineering. 3. Students are expected to develop a statistical way of thinking and ability for the successful usage of the statistical concept, theory and notations.

S. No.	CLO/PLOS MAPPING	DOMAIN	PLO
1	Explain the use of descriptive techniques to describe the statistical data	C2	01
2	Use the concepts and methods of probability theory for solving problems in engineering sciences	C3	01
3	Analyze the population parameters on the basis of sample study using the techniques of inferential statistics.	C4	02
COURSE CONTENTS			

Statistics: Introduction, Types of data &variables, presentation of data, object, classifications, Tabulation, Frequency Distribution, Graphical Representation, Simple &Multiple Bar diagrams, Sartorial & Pie-Diagram, Histogram, Frequency Polygon, Frequency Curves & their types.

Measures of Central Tendency and Dispersion:

Statistics Averages, Median, Mode, Quartiles, Range, Moments, Skewness&Kurtosis, Quartile Deviation, Mean Deviation, Standard Deviation, Variance& its coefficient, Practical Significance in related problems. Curve Fitting: Introduction, fitting of a first and second degree curve, fitting of exponential and logarithmic curves, related problems, Principle of least squares, Second order Statistics &Time series.

Simple Regression & Correlation:

Introduction, Scatter diagrams, Correlation & Coefficient, Regression lines, Rank Correlation & its Coefficient, Probable Error (P.E), related problems.

Sampling and Sampling Distributions:

Introduction, Population, Parameter & Statistics, Objects of sampling, Sampling distribution of Mean, Standard errors, Sampling &Non-

Sampling Errors, Random Sampling, Sampling with &without replacement, Sequential Sampling, Central limit the error with practical significance in related problems.

Statistical Inference and Testing of Hypothesis:

Introduction, Estimation, Types of Estimates, Confidence interval, Tests of Hypothesis, Chi-Square distribution/test, one tails & two tails tests. Application in related problems.

Probability:

Basic concepts, Permutation & Combination, Definitions of probability, Laws of probability, Conditional probability, Baye's rule.Related problems impractical significance.

Random Variables:

Introduction, Discrete & Continuous random variables, Random Sequences and transformations, Probability distribution, Probability density function, Distribution function, Mathematical expectations, Moment Generating Function (M.G.F.), Markove random walks chain/Related problems.

Probability Distributions:

Introduction, Discrete probability distributions, Binomial, Poisson, Hypergeometric& Negative binomial distributions.Continuous probability distribution, Uniform, Exponential & Normal distributions & their practical significance.