MTH302:PROBABILITY AND STATISTICS

L:3 T:0 P:0 Credits:3

Course Outcomes: Through this course students should be able to

CO1 :: recall the concept of random variables and its distribution functions.

CO2 :: recognize relationships among the variables through correlation and regression.

CO3 :: apply probability distributions to find the solution of different engineering problems.

CO4 :: describe sample, population and statistical inference.

CO5 :: understand hypothesis testing and its applications.

Unit I

Random Variables and Probability Distributions : discrete and continuous random variables and their distribution functions, joint probability distributions, mean, variance and covariance of random variables, Chebyshev's theorem(without proof)

Unit II

Correlation and Linear regression : scatter plots, correlation coefficient and its properties, Karl Pearson’s correlation coefficient, Spearman’s rank correlation coefficient, Linear regression and its properties

Unit III

Special Discrete Distributions : the Bernoulli process, binomial distribution and its moment generating function (mgf), negative binomial distribution and its mgf, geometric distribution and its mgf, Poisson distribution and its mgf

Unit IV

Special Continuous Distributions : normal distribution and its mgf, normal approximation to the binomial, gamma distribution and its mgf, exponential distribution and its mgf

Unit V

Point Estimation and the Central Limit Theorem : unbiased estimator, consistent estimator, efficient and sufficient estimator, likelihood function and maximum likelihood estimation, the central limit theorem(without proof)

Unit VI

Hypothesis Testing : Types of Error, F-test, Student t-test for single mean and difference of means, Z-test for single mean and difference of means, Chi-square test for goodness of fit

Text Books:

1. PROBABILITY AND STATISTICS FOR ENGINEERS AND SCIENTISTS by RONALD E. WALPOLE, RAYMOND H. MYERS,SHARON L. MYERS, AND KEYING YE, PEARSON

References:

1. PROBABILITY STATISTICS AND RANDAM PROCESSES by T VEERARAJAN, MCGRAW HILL EDUCATION

2. FUNDAMENTALS OF MATHEMATICAL STATISTICS by S.C.GUPTA AND V.K.KAPOOR, SULTAN CHAND & SONS (P) LTD.