

SYLLABUS :-

Pre requisite: void

Probability: Classical, relative frequency and axiomatic definitions of probability, addition rule and conditional probability, multiplication rule, total probability, Bayes' Theorem and independence.

Random Variables: Discrete, continuous and mixed random variables, probability mass, probability density and cumulative distribution functions, mathematical expectation, moments, moment generating function, Chebyshev's inequality.

Special Distributions: Discrete uniform, binomial, geometric, negative binomial, hypergeometric, Poisson, uniform, exponential, gamma, normal, beta, lognormal, Weibull, Laplace, Cauchy, Pareto distributions. Functions of a Random Variable.

Joint Distributions: Joint, marginal and conditional distributions, product moments, correlation, independence of random variables, bivariate normal distribution, simple, multiple and partial correlation, regression.

Sampling Distributions: Law of large numbers, Central Limit Theorem, distributions of the sample mean and the sample variance for a normal population, Chi-Square, t and F distributions.

Estimation: The method of moments and the method of maximum likelihood estimation, properties of best estimates, confidence intervals for the mean(s) and variance(s) of normal populations.

Testing of Hypotheses: Null and alternative hypotheses, the critical and acceptance regions, two types of error, power of the test, the most powerful test and Neyman-Pearson Fundamental Lemma, standard tests for one and two sample problems for normal populations.