Details: (MSO201)

Syllabus: Pre-requisite: MTH 101, None for M.Sc. 2 yr

Probability:- Axiomatic definition, properties, conditional probability, Bayes' rule and independence of events. Random variables, distribution function, probability mass and density functions, expectation, moments, moment generating function, Chebyshev's inequality. Special distributions; Bernoulli, binomial, geometric, negative binomial, hypergeometric, Poisson, exponential, gamma, Weibull, beta, Cauchy, double exponential, normal. Reliability and hazard rate, reliability of series and parallel systems. Joint distributions, marginal and conditional distributions, moments, independence of random variables, covariance and correlation. Functions of random variables. Weak Law of large numbers and Central limit theorems.

Statistics:- Descriptive statistics, graphical representation of the data, measures of location and variability. Population, sample, parameters. Point estimation; method of moments, maximum likelihood estimator, unbiasedness, consistency. Confidence intervals for mean, difference of means, proportions. Testing of hypothesis; Null and Alternate hypothesis, Neyman Pearson fundamental lemma, Tests for one sample and two sample problems for normal populations, tests for proportions.

Reference materials:

1. Robert V. Hogg, J.W. McKean, and Allen T. Craig: Introduction to Mathematical Statistics, Seventh Edition, Pearson Education, Asia.
2. Edward J Dudewicz and Satya N. Mishra: Modern Mathematical Statistics, Wiley.

Credits: 11