

STATISTICS SYLLABUS

UNIT – I (Probability Theory)

Definition—Classical and axiomatic approaches. Laws of total and compound probability, conditional probability, Bayes Theorem. Random variable and its distribution function, mathematical expectation, generating functions (moment generating, characteristic and probability generating functions). Convergence in distribution and probability, laws of large numbers, central limit theorem. Joint distribution of two random variables, marginal and conditional distributions.

UNIT – II (Probability Distributions)

Discrete probability distributions—Binomial, Poisson, Negative Binomial, Hypergeometric and Multinomial distributions.

Continuous probability distributions—Exponential, Normal, Uniform, Beta, Gamma, Cauchy and Bivariate Normal distributions.

UNIT – III (Statistical Methods)

Frequency distribution, graphical and diagrammatic representation of data. Measures of location and dispersion, moments, skewness and kurtosis. Curve fitting, association of attributes. Simple correlation and regression, partial and multiple correlations and regressions, correlation ratio. Distribution of sample mean; t , F and Chi-square distributions.

UNIT – IV (Estimation and Testing of Hypothesis)

Characteristics of a good estimator. Estimation by the methods of maximum likelihood and least squares, properties of maximum likelihood estimator, Cramer-Rao inequality, sufficient statistic and Rao-Blackwell theorem. Interval estimation.

Testing of simple and composite hypotheses, types of errors, critical region. Neyman-Pearson fundamental lemma, power function, MP and UMP tests. Non-parametric tests—Sign, median and run tests, large sample tests, tests based on t , F and Chi-square distributions.

UNIT – V (Sampling Techniques and Designs of Experiments)

Census versus sample surveys. Simple random sampling, stratified sampling, systematic sampling, sampling with probability proportional to size. Ratio and regression methods of estimation.

Principles of designs of experiment. Lay out and analysis of completely randomized, randomized block and Latin square designs. Factorial experiments (2^2 , 2^3 and 3^2 experiments)