

DEPARTMENT OF STATISTICS**SSTAVAC01- Statistical Methods FOR Data Analysis****Learning Objectives**

Enright the students to acquire skills for adopting statistical tools and techniques of data analysis.

Course Outcomes

At the end of the course, the student will be able to

- Understand the various concepts of statistical tests and to apply large sample tests.
- Apply the exact tests for research problems.
- Apply the various chi-square tests.
- Apply the multiple regression analysis and multivariate tests for real life problems
- Apply the non-parametric tests for sample data.

Unit I

Tests of significance- population and sample; parameter and statistic standard error and sampling distribution of a statistic; Utility of Standard error; Steps involved in any test of significance; Basic concepts; Large sample tests- Tests for mean and difference of means; single proportion and equality of proportions; difference of standard deviations ; testing the correlation coefficient; equality of two correlation coefficients.

Unit II

Exact tests- Test for mean; equality of means and for paired samples; observed partial and multiple correlation and regression coefficients; test for one population variance and test for equality of two population variances; test for observed sample correlation ratio.

Unit III

Chi-square test for goodness of fit- contingency tables; test for independence of attributes; Yate's correction for contingency table; Bartlett's test for homogeneity of several population variances; test for homogeneity of several population proportions.

Unit IV

Multiple regressions- interpretation of R^2 ; interpretation of partial regression coefficients; test for linearity of regression; test for intercept in a regression. Application of Multivariate tests- Test for population mean vector (for covariance matrix known and unknown). Test for equality of two population mean vectors when the covariance matrices are equal; (known and unknown) Mahalanobis D^2 test.

Unit V

Non parametric methods; Advantages and disadvantages over parametric methods. Sign test for medians, Median test for two populations, Wald-Wolfwitz run test, Kruskal-Wallis Rank sum Test (H-Test), Mann-Whitney-Wilcoxon rank sum test, U-test, Kolmogorov – Smirnov, Test for goodness of fit, Test for comparing two populations, Test for randomness, Friedman's test.

Book for Study and Reference:

- Catelcult. R. 1982. *Statistics in Research and Development*, Chapman and Hall.
- Croxtan, E. F. and Cowden, D. J. 1985. *Statistics Practical Business Statistics*, Prentice Hall.
- Gupta S. C. and V. K. Kapoor 2007. *Fundamentals of Mathematical Statistics*, Sultan Chand & Sons.
- Medhi. J. 1992. *Statistical methods*, Wiley Eastern Ltd.
- Norma Gilbert, 1981. *Statistics*, Saunders College publishing.
- Ostle. B. and Mensing R. W. 1975. *Statistics in Research*, Third Edition, Oxford & IBH Publishers Co.,
- Rajagopalan V. 2006. *Selected Statistical Tests*, New Age International Publishers (P) Ltd., New Delhi.