

Objective

This course is meant for students of all disciplines including agricultural and animal sciences. The students would be exposed to the concepts of correlation and regression. Emphasis will be laid on diagnostic measures such as autocorrelation, multicollinearity and Heteroscedasticity. This course would prepare students to handle their data for analysis and interpretation.

Theory

UNIT I

Introduction to correlation analysis and its measures; Correlation from grouped data, Biserial correlation, Rank correlation; Testing of population correlation coefficients; Multiple and partial correlation coefficients and their testing.

UNIT II

Problem of correlated errors; Auto correlation; Durbin Watson Statistics; Removal of auto correlation by transformation; Analysis of collinear data; Detection and correction of multicollinearity; Regression analysis; Method of least squares for curve fitting; Testing of regression coefficients; Multiple and partial regressions.

UNIT III

Examining the multiple regression equation; Concept of weighted least squares; regression equation on grouped data; Various methods of selecting the best regression equation; regression approach applied to analysis of variance in one way classification.

UNIT IV

Heteroscedastic models, Concept of nonlinear regression and fitting of quadratic, exponential and power curves; Economic and optimal dose, Orthogonal polynomial.

Practical

Correlation coefficient, various types of correlation coefficients, partial and multiple, testing of hypotheses; Multiple linear regression analysis, partial regression coefficients, testing of hypotheses, residuals and their applications in outlier detection; Handling of correlated errors, multicollinearity; Fitting of quadratic, exponential and power curves, fitting of orthogonal polynomials.

Suggested Readings

Draper NR & Smith H. 1998. *Applied Regression Analysis* . 3rd Ed. John Wiley.

Ezekiel M. 1963. *Methods of Correlation and Regression Analysis* . John Wiley.

Kleinbaum DG, Kupper LL, Muller KE & Nizam A. 1998. *Applied Regression Analysis and Multivariable Methods* . Duxbury Press.

Koutsoyiannis A. 1978. *Theory of Econometrics* . MacMillan.

Kutner MH, Nachtsheim CJ & Neter J. 2004. *Applied Linear Regression Models* . 4th Ed. With Student CD. McGraw Hill.