

- Dean, A. and Voss, D. (1999). Design and Analysis of Experiments, Springer. First Indian Reprint 2006

**Note: Examination scheme and mode shall be as prescribed by the Examination Branch University of Delhi, from time to time.**

## DISCIPLINE SPECIFIC CORE COURSE –18: ECONOMETRICS

### CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITES OF THE COURSE

Course title & Code	Credits	Credit distribution of the course			Eligibility criteria	Pre-requisite of the course (if any)
		Lecture	Tutorial	Practical/ Practice		
Econometrics	4	3	0	1	Class XII pass with Mathematics	knowledge of sampling distributions and linear models

### Learning Objectives

A broad knowledge of regression analysis relevant for analyzing economic data.

- Interpretation and critical evaluation of the outcomes of empirical analysis.
- Distinguish the results of violating the assumptions of a classical regression model.
- To judge the validity of the economic theories and carry out their evaluation in numerical terms.
- To extract useful information about important economic policy issues from the available data.
- The course is designed to provide the students with the basic quantitative techniques needed to undertake applied research projects.
- The students learn to quantify and examine economic relationships employing statistical methods based on observed data.

### Learning Outcomes:

After completing this course, students should have developed a clear understanding of:

- Students will be trained to write a good quality undergraduate research paper in applied statistics using the econometric methods taught in this class.
- The fundamental concepts of econometrics.
- Specification of the model.
- Multiple Linear Regression.
- Multicollinearity.
- Heteroscedasticity.
- Autocorrelation.
- Autoregressive and Lag models

## **SYLLABUS OF DSC-18**

### **Theory**

#### **UNIT I**

**(15 hours)**

##### **Introduction**

Objective behind building econometric models, Nature and scope of econometrics, model building, role of econometrics. General linear model (GLM). Estimation under linear restrictions.

#### **UNIT II**

**(10 hours)**

##### **Multicollinearity**

Introduction and concepts, detection of multicollinearity, consequences, remedies Multicollinearity, tests and solutions of multicollinearity.

#### **UNIT III**

**(10 hours)**

##### **Generalized least squares and Autocorrelation**

Generalized least squares estimation, Aitken estimators. Autocorrelation: concept, consequences of autocorrelated disturbances, detection and solution of autocorrelation.

#### **UNIT IV**

**(10 hours)**

##### **Heteroscedastic disturbances**

Heteroscedastic disturbances: Concepts and efficiency of Aitken estimator with OLS estimator under heteroscedasticity. Consequences of heteroscedasticity. Tests and solutions of heteroscedasticity. Qualitative Forecasting Methods.

### **PRACTICAL/LAB WORK – (30 hours)**

#### **List of Practical:**

1. Problems based on estimation of General linear model.
2. Testing of parameters of General linear model.
3. Forecasting of General linear model.
4. Problems related to consequences of Multicollinearity.
5. Diagnostics of Multicollinearity.
6. Problems related to consequences of Autocorrelation (AR(I)).
7. Diagnostics of Autocorrelation.
8. Estimation of General linear model under Autocorrelation.
9. Problems related to consequences Heteroscedasticity.
10. Diagnostics of Heteroscedasticity.
11. Estimation of problems of General linear model under Heteroscedastic disturbance terms.
12. Problems concerning specification errors as a reason for induction of Autocorrelation, Heteroscedasticity and Multicollinearity.
13. Problems related to General linear model under (Aitken Estimation).
14. Forecasting methods.

**Practical work to be conducted using electronic spreadsheet / EXCEL/ Statistical Software Package/ SPSS/ calculators.**

### **ESSENTIAL READINGS**

- Gujarati, D. and Guneshker, S. (2007). Basic Econometrics, 4th Ed., McGraw Hill Companies.
- Johnston, J. (1972). Econometric Methods, 2nd Ed., McGraw Hill International.