Econometrics-I, August-December 2021

Instructor: Bharti Nandwani (bharti@igidr.ac.in)

Required Texts:

1. *Econometric Methods* (4th edition), Jack Johnston and John DiNardo, McGraw-Hill Publishers, ©1997.

2. *W.H. Greene, Econometric Analysis, 7th. ed., Upper Saddle River, NJ: Pearson Education (Prentice-Hall), 2012*

Recommended Texts:

1. *Econometric analysis of cross section and panel data,* by Jeffrey M. Wooldridge, MIT press, 2010.

2. *A First Course in Business Statistics,* by J. T. McClave, P. G. Benson and T. Sincich, Prentice Hall, (8th Edition).

3. *Estimation and Inference in Econometrics*, by Russell Davidson and James G. Mackinon, Oxford University Press, 1993.

4. *Microeconometrics*, by A.C. Cameron and P.K. Trivedi, Cambridge University Press, 2005.

Course Outline:

The objective of the course is to give students an exposure to basic econometric theory and a practical understanding of the subject through examples and empirical applications. Designed for graduate students, the course will cover simple linear regression and multivariate regression, finite sample and asymptotic properties of OLS, inference and prediction, generalized and restricted least square, multicollinearity, heteroscedasticity and generalized methods of moments. Elementary knowledge of probability, statistics, and matrix algebra would be helpful, but is not required. A review of the relevant concepts would be done as and when required.

Course Grading:

Grading for the course will be based on home assignments (15%), one empirical project (15%), one midterm examination (30%), and a final examination (40%). Class participation will count for borderline grades. Regular attendance is required.

Course Contents

1. Classical Linear Regression Models

1.1 Least squares: assumptions

1.2 Estimation

1.3 Statistical properties

1.3.1 Finite sample

1.3.2 Large sample – introduction to asymptotic theory

1.4 Hypothesis testing and Inference

2. Classical Linear Regression Models: Special Topics

2.1 Partitioned regression

2.3 Dummy variables

2.5 Choice of Functional form and tests of model specification

2.5.1 Omission of relevant variables

2.5.2 Inclusion of irrelevant variables

Suggested problems

3. Classical Linear Regression Models: Data problems

4. Endogeneity – Instrumental Variables Estimation methodology

5. The General Model: Free Variance - Covariance Matrix

5.1 The general linear model – known variance-covariance matrix

5.1.1 Specification and interpretation

5.1.2 Estimation

The Ordinary least squares estimator

The Generalised least squares estimator

The Maximum likelihood estimator

5.1.3 Inference and testing

5.2 The general linear model – unknown variance-covariance matrix

5.2.1 Heteroskedasticity

Estimation under alternative specifications

Tests for alternative specifications

5.2.2 Autocorrelation

Estimation under alternative specifications

Tests for alternative specifications

5.2.3 Inference and testing

Course outcome:

The course gives students an exposure to basic econometric theory and a practical understanding of the subject through examples and empirical applications. Particularly, students will be taught in detail when to use and when to abandon OLS methodology. Students will also know other estimation methodologies when OLS assumptions are violated.