

**Centre for International Trade and Development
School of International Studies**

Course: MA in Economics (with specialisation in World Economy)

Course Title: IE 504: Advanced Econometrics

Course Type: Optional

Course Teacher: Professor Amit S Ray

Credits: 4

Contact Hours: 4 per week

Course Objectives

The course introduces a selection of advanced econometric methods and their applications to students with the pre-requisite knowledge of the course IE408: Introduction to Statistics and Econometrics (or equivalent).

Learning Outcomes

- Develop analytical skills to enable students to read and critically evaluate econometrics research output and to design and execute applied econometric research.
- Develop technical skills to understand and apply these econometric tools as expected from a professional economist working in the academic or corporate sectors.

Evaluation Methods

Evaluation will have two components – (1) End Semester examination and (2) a project consisting of designing and estimating an applied econometric model using secondary data.

Course Content

1. Review of CLRM and its assumptions
2. Problem of multicollinearity and solutions
 - a. Principal components analysis
3. Specification errors – Functional form, Inclusion of irrelevant variables
4. Problem of endogeneity - Omitted variables, measurement errors, reverse causality
5. Instrumental Variables Method
6. Seemingly Unrelated Regressions
7. Simultaneous Equations Model
 - a. Identification
 - b. ILS
 - c. 2SLS
 - d. 3SLS
8. Use of dummy variables in econometrics – structural change, threshold effects
9. Treatment effects
 - a. Difference in difference (DID)
 - b. Randomised control trials (RCT)
10. Models with discrete dependent variables:
 - a. Binary
 - b. Multinomial, Ordered, Sequential, Randomised
11. Models of limited dependent variables

- a. Censored model
 - b. Truncated models
12. Models for Panel data
- a. Fixed effect versus random effects models

Readings

1. W. Greene, *Econometric Analysis*, Prentice Hall
2. J.M. Wooldridge, *Introductory Econometrics: A modern approach*, SouthWestern Cengage Learning
3. J. Johnston and J. DiNardo, *Econometric Methods*
4. G. S. Madala, *Limited Dependent and Qualitative Variables in Econometrics*, Cambridge University Press
5. G. Judge et al., *The Theory and Practice of Econometrics*, Wiley