Discipline-Specific Core (DSC) Course 4b: Econometrics

Structure 1: PG Curricular Structure with only Course Work
Structure 2: PG Curricular Structure with Course Work + Research

Course Title & Code	Credits	Credit Distribution of the Course			Eligibility Criteria	Prerequisite of the course (if any)
		Lecture (45 Hours)	Tutorial (15 Hours)	Practical (00 Hours)		
DSC 4b: Econometrics	4	3	1	0	NIL	NIL

Course Objectives:

- To apply general linear model (GLM) and Ordinary Least Squares (OLS) on Economic data sets.
- To test hypothesis for regression coefficients under Bayes paradigm.
- Model building and evaluation.
- Assessment of lag length using statistical criteria and economic reasoning.

Course Learning Outcomes:

After successful completion of this course, students will be able to:

- Acquire knowledge of various advanced econometric models, estimation methods and related econometric theories.
- Conduct econometric analysis of data.
- Apply statistical techniques to model relationships between variables and make predictions.

Unit I (11 Hours)

Econometrics: Review of GLM and ordinary least squares, GLM with stochastic regressors, Instrumental variables (I.V): estimation, consistency property, asymptotic variance of I.V estimators. Bayesian analysis of linear model with non-informative priors and conjugate priors.

Unit II (12 Hours)

Distributed lag models, polynomial lag models, Almon's lag model, determination of degree of polynomial and lag length. Adaptive expectation model, partial adjustment model, compound geometric lag model, and methods of estimation.

Unit III (11 Hours)

The Granger Causality Test, simultaneous-equation models: identification problems. Restrictions on structural parameters – rank and order condition for identification.

Unit IV (11 Hours)

Simultaneous-equation methods: Estimation - Recursive systems, two stage least squares (2SLS) estimators, and full information maximum likelihood (FIML).

Tutorial:

Tutorial sessions will include at least one activity such as group discussion/presentation/ problem solving exercise based on the material covered in the lectures along with scholastic work related to the conceptual understanding of the subject.

Essential Readings:

1. Greene, W.H. (2003). *Econometric Analysis*, Prentice Hall.
2. Gujarati, D.N. and Porter, D.C. (2009). *Basic econometrics*, McGraw-Hill.
3. Maddala, G.S. (2001). *Introduction to Econometrics*, John Wiley & Sons.
4. Ramanathan, R. (2002). *Introductory Econometrics with Applications*, Harcourt College Publishers.

Suggested Readings:

1. Baltagi, B. H. (2021). *Econometrics*, Springer
2. Hayashi, F. (2000). *Econometrics*, Princeton University Press.
3. Johnston, J. (1984). *Econometric Methods*, McGraw Hill.
4. Kennedy, P. (2008). *A Guide to Econometrics*, Blackwell Publishing.
5. Kment, J. (1986). *Elements of Econometrics*, Mac Millan.