

**Code: ECON-405**

**Title: Econometrics-II**

**Credit Hours: 03**

**Objectives:**

This course follows up the data analysis and data estimation techniques included in Econometrics I. The major objective of this course is to enable the student for competing in a job market where positive analysis is increasingly becoming subject to highly intensive and extensive analytical formulations, largely owing to the unprecedented and remarkable development in information technology. The main Course Contents of the course include panel data estimation techniques, identification problem and dummy dependent variable, the Logit/Probit model. Hence, this course is designed for senior undergraduates more inclined towards quantitative studies. The objective is to enable the students dive deep into complex problems of the real world economic life. The students have to learn certain computer packages like SPSS, E-views and Stata besides Excel.

**Lab work**

The students are required to devote at least two hours per week to computer laboratory. They have to attend classes to learn various Econometrics software for practical application of Econometric models they have learnt so far.

**Course Contents**

**Matrix Approach of the Classical Linear Regression Model**

The multiple regression (K-variable) model in matrix format, Assumptions of the model, The Least-Squares estimation procedure in matrix notation, Properties of the OLS estimators, Interpretation of the Beta coefficients ( $\beta_1, \beta_2, \dots, \beta_k$ ), Hypothesis testing using matrix approach, Forecasting in OLS model, OLS estimation: variance-covariance matrix of estimators, Coefficient of determination,  $R^2$ , in matrix notations, Correlation matrix.

**Model Specification**

Model selection criteria, Types of specification errors, Consequences of model, specification errors, Tests of specification errors, Errors of measurement, Model selection criteria, Endogeneity: where X is not fixed in repeated sampling, Nature of Endogeneity, OLS estimation in presence of Endogeneity, Detection of Endogeneity, BLUE estimator in the presence of Endogeneity, Consequences of Endogeneity in OLS estimation, Remedial

measures.

### **Categorical Variables in regression**

Nature of dummy variables, ANOVA models with qualitative variables, Regression with dummy independent variables, Logit/Probit models, Use of indicator variables, Multinomial logit/probit models.

### **Simultaneous Equation Models & Estimation Methods**

Simultaneous equation models, Nature of simultaneous equations, Examples of simultaneous equation models from economic theory, Inconsistency of OLS estimators, Identification problem, Notations and definitions, Unidentified, exactly identified and over identified, Rules for identification, Simultaneous equation approaches to estimation, Method of indirect least squares (ILS), Method of two stage least squares (2SLS), Instrumental Variable approach to 2SLS.

### **Time Series Econometrics**

Concept of Stationarity, Tests of Stationarity, Unit Root test, Transforming Non-stationary Time Series, ARMA and ARIMA Models, Comparison of forecast based on ARIMA and regression models, Co-integration and Error Correction Mechanism (ECM), VAR models, ARCH models.

### **Panel Data**

Why panel data regression models, Estimation of pool data regression models, Common intercept method, fixed effects model, Least Square Dummy Variables Approach, Random effects model, Generalized Least Square Approach, Fixed effects model vs. random effects model, Hausman Specification Test.

### **Recommended Books:**

- Stock H. J. and Watson M. W. (2003), Introduction to Econometrics, India: Pearson Education. Latest edition
- Gujarati, D. Porter, D. (2009). Basic Econometrics, McGraw-Hill Company. 5th edition
- Jeffrey M. Wooldridge J. M., (2001). Econometric Analysis of Cross Section and Panel Data”, The MIT Press, Latest edition.
- Johnston, J. & John D. (1997). Econometric Methods. The McGraw Hill Companies, Inc, Singapore. Latest edition/
- Greene W. H (latest edition), Econometrics Analysis, Pearson Education, Inc.