Course Code: ECON-320

Title: Econometrics-I

Credit Hours: 03

Prerequisite: Elementary Statistics, Probability and Probability Distributions

Course Objectives:

This is a foundation course for enabling the students of Economics to analytically formulate and statistically estimate the economic problems for verifying the empirical validity of theoretical models. The analytical skill is supported by the usage of different Econometrics Software.

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.

Learning Outcomes:

On completion of this course, students would be able to

- Have a complete knowledge of the basic concepts of the subjects thus enabling them to attain higher education in the field of econometrics
- This course will enable the students to apply tools of mathematics and statistics to to identify the relationships between economic variables
- This will help the students to estimate and evaluate some of the basic and advanced econometric models
- It will guide the students to use econometric models for forecasts and managerial decision making.
- It will also help the students in conducting the research work necessary for completing B.sc Honor programme

Course Contents:

Introduction	Definition and scope of Econometrics, Economic theory as the basis for empirical analysis, Mathematical and Econometric models, Application of Statistical techniques to Economic data, Ingredients of Econometric modeling: Specification, Estimation, Evaluation and Forecasting. Data Types and Sources, Cross-sectional data, time-series data and pool data, Data at current and constant prices, Sources of data.
The Simple Two-Variable Model	Simple Regression function, population and regression function, linear regression function: linearity in variables and linearity in parameters, Simple Regression Analysis: Estimation, Method of Ordinary Least Squares (OLS), Estimation of regression equation using OLS, Standard error of estimates, Numerical properties of OLS estimators, Statistical properties of OLS estimators (BLUE),

	Classical Linear Regression Model (CLRM), Assumptions of CLRM, Estimation of the coefficient of determination, Interval estimation of regression coefficients, Classical Normal Linear Regression Model (CNLRM), Difference between CLRM and CNLRM, Properties of OLS estimates under CNLRM, Simple Linear Regression Analysis: Inference, Confidence interval approach for regression coefficients, Test of significance approach for regression coefficients, Analysis of variance (ANOVA), Test of the overall significance of the model, Simple Linear Regression Analysis: Extensions, Regression through the origin, Scaling and measurement of variables, Functional Forms of Regression Function, Log linear models, Cobb Douglas production function Log-Lin models, The constant growth model, Estimating the growth rate, Lin-Log models, Engel curve, Reciprocal models.
The Multiple Linear Regression Model (MLRM)	Multiple Regression Analysis, Difference between simple and multiple regression analysis, Interpretation of multiple regression function, Multiple Regression Analysis: Estimation, OLS estimation of multiple regression equation, Standard error of partial regression coefficients, Properties of OLS estimators, Coefficient of determination (R2), R2 and Adjusted R2 , Multiple Regression Analysis: Inference, Test of individual significance (t-test), Test of overall significance (F-test) Multiple Regression Function: Extensions, Testing the equality of parameters, Testing linear equality restriction, Testing for structural stability of regression models: The Chow test.
Categorical Variables in regression	Nature of dummy variables, ANOVA models with qualitative variables, Regression with dummy independent variables
Deviation from the Classical Assumptions	Assumptions of the classical model and economic reality, Relaxation of the assumptions and estimation issues, Brief introduction to the nature of problems and alternatives.
Multicollinearity	Linear relationship between any two explanatory variables, Nature and severity of the problem, OLS estimation of regression equation in the presence of perfect multicollinearity, Causes of multicollinearity, Distinction between perfect and partial Multicollinearity, Detection of the problem and remedial measures.

Teaching Methodology:

- To deliver lectures on topics included in course outline

- To require each student to solve independent assignments on topics included in the course including the lab work.

Evaluation Criteria:

Evaluation Method	
Quizzes/Assignments	
Mid-Term Exam	
Final-Term Exam	

Recommended Books:

- Gujrati, D. J. Basic Econometrics – 4th Edition (2003) McGraw-Hill Company.
- Maddala, G. S. (1988) Econometrics – McGraw-Hill Company.
- Dougherty, C. (2002). Introduction to Econometrics–2nd edition Oxford University Press.
- Pindyck & Rubinfeld (1992). Econometric Models & Economic Forecasts- 3rd Edition, McGraw-Hill Inc.
- Stock H. J. and M. W. Watson (2003). *Introduction to Econometrics*, India: Pearson Education.