

M.A III SEMESTER
Paper –III (Basic Econometrics)

Course Title	Basic Econometrics
Course Type	Core Course
Credit Value	05
Max. Marks	100
Course Learning Outcomes CLO)	On successful completion of this course, the students will be able to: 1. To apply the method of Ordinary Least Squares to estimate and interpret simple and multiple linear regression models. 2. To evaluate the validity of classical OLS assumptions and diagnose potential violations (e.g. multi collinearity, heteroskedasticity). 3. To incorporate and interpret dummy variables in regression frameworks, including ANOVA and seasonal models. 4. To formulate and estimate basic distributed lag and AR-DL models for time-series analysis. 5. To analyze identification issues in simultaneous-equation systems and explain the need for advanced estimation techniques.

Unit	Topics
Unit-1 Nature and scope of econometrics	Meaning of Econometrics; Importance of Econometrics as a separate discipline; Methodology of Econometrics. Activities - Identify 5 Causal Relationships from the news articles, identifying Dependent and Independent variables. IKS: History of Optimization Models in Evolutionary Algorithms
Unit -2 Simple Linear Regression Model: Two Variable Case	The concept of Population Regression Function (PRF) and Sample Regression Function (SRF); Ordinary Least Squares (OLS); The Classical Linear Regression Model: The Assumptions Underlying the Method of Least Squares; Properties of Least-Squares Estimators: The Gauss- Markov Theorem (Proof); The Coefficient of Determination R^2. Activities – Hands-On OLS Estimation with Real Data 1. Provide students with a small CSV (e.g., data on advertising spend vs. sales). 2. In pairs, they compute by hand (with calculators) the OLS estimates β_0 and β' for a 5-point sample. 3. Plot the points and fitted line on graph paper. 4. Compute R^2 and interpret its meaning. 5. How does a single outlier change β'
Unit -3 Multiple linear regression model	Interpretation and application of Multiple Regression Equation; forms of Multiple Regression Equation (MLRM).

	Activity – Use a data set from one of the books mentioned in the reference to run a Regression on Excel and interpret the results.
Unit -4 Introduction to Dummy Variable Regression Models	The Nature of Dummy Variables ANOVA Models; Regression with a Mixture of Quantitative and Qualitative Repressors: The ANCOVA Models; The Use of Dummy Variables in Seasonal Analysis. Activity – Using the quarterly data for Agricultural produce, estimate a regression model with the help of Excel to include the seasonality in the produce.
Unit -5 Introduction to Distributed Lag Models and Simultaneous-Equation Models	Introduction to AR-DL models- Problems in estimation and their application, detecting autocorrelation in Autoregressive Model (Durbin h- test); Need of studying Simultaneous Equation Models- Problem of Endogeneity, Rank and Order conditions of Identification. Activity - Identify 5 Simultaneous relationships in Economic Theory.

Recommended Supporting Books/Texts/Reading Material:

1. Gujarati, Damodar. N. and Porter, D.C. (2008) Basic Econometrics, 5th Edition, McGraw-Hill, Boston.
2. Wooldridge, J. M. (2016). Introductory Econometrics: A Modern Approach. Adrian MI: South-Western Cengage Learning.
3. Maddala, G.S. (2001) Introduction to Econometrics. 3rd Edition, Wiley, New York.
4. Koutsoyiannis, A. (2003) Theory of Econometrics. 2nd Edition, Palgrave.
5. Stock, J. H., & Watson, M. W. (2018). Introduction to Econometrics. London: Pearson.
6. IKS: History of Optimization Models in Evolutionary Algorithms

