Devi Ahilya University, Indore, India Institute of Engineering & Technology				MSc – II Year (Applied Mathematics) with Specialization in Computing & Informatics Semester- IV			
Subject Code & Name	**Instructions Hours per Week**			**Credits**			
AM4EM4: Econometrics	**L**	**T**	**P**	**L**	**T**	**P**	**Total**
	3	**-**	**-**	**3**	**-**	**-**	**3**
Duration of Theory Paper: 3 Hours							

Learning Objectives:

- The objective of the course is to teach students how to apply relevant econometric methods to analyse data and interpret the results from such analyses.
- The focus is on conceptual understanding and 'hands on' applications using economic data drawn from real-world examples, rather than on formal theoretical proofs.
- Students should be able to appreciate and interpret the econometric and statistical analysis and be able to carry out and interpret their own econometric analysis.

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Prerequisite(s): Basic knowledge of mathematical statistics with a serious analytical treatment of estimation and inference and Students should be familiar with basic concepts of probability theory.

COURSE OF CONTENTS

Unit-I:

Nature of Econometrics and Economic Data Definition of Econometrics – Steps in Empirical Economic Analysis - Econometric Model – The Role of Measurement in Economics – The Structure of Economic Data: Cross-Sectional data, Time Series data, Pooled Cross Section data, Panel Data.

Unit-II:

Simple Regression Model Two Variable Linear Regression Model: Assumptions, Estimation of Parameters, Tests of Significance and Properties of Estimators – Functional forms of Regression models – Loglinear models, Semi log- models and Reciprocal models – Choice of Functional Form, The General Linear: Model Review of Assumptions, Estimation and Properties of Estimators: Un-biasness, BLUEs and Tests of significance of estimates,

Unit-III:

Multicollinearity: Source and Consequences, Tests for Multicollinearity and solutions for Multicollinearity. Heteroscadasticity: Sources and Consequences, Tests for Heteroscadasticity. Autocorrelation: Source and Consequences, Tests for Autocorrelation and solutions for Autocorrelation.

Unit-IV:

Analysis of Variance - Dummay variables - Nature of Dummy variables – Use of Dummy Variables – Errors in Variables and its consequences.

Auto-regressive and Distributed Lag Models Introduction – Types of Lag schemes - Koyck's lag model, Almon's Lag scheme, Partial Adjustment and Expectations models - Causality in Economics – The Granger Causality Test.

Unit-V:

Simultaneous Equation Models Specification – Simultaneous Bias – Inconsistency of OLS Estimators - The concept of Identification, Rank and Order conditions for Identification – Indirect Least Squares - Two stage Least Squares (without proof), Problems.

Learning Outcomes:

On completion of this course you should be able to:

- Use various advanced econometric models, estimation methods and related econometric theories.
- Application of appropriate econometric methods to test an economic theory including deriving and test a specific hypothesis relevant to a general economic or policy question.
- Interpretation and critical evaluation of the outcomes of empirical analysis.

BOOKS RECOMMENDED:

1. Johnston,J - Econometric Methods, 4th Ed, New York, McGraw-Hill Book Co. 1996.
2. Maddala, G.S: Econometrics, 3rd Ed, New York, McGraw-Hill Book Co., 1977
3. Gujarathi, D.N: Basic Econometrics, Fourth Edition, New Delhi, Tata McGraw-Hill, 2003
4. Tintner,G: Econometrics, New York. John Wiley & Sons, 1952.
5. Wooldridge, Jeffery M: Introductory Econometrics: A Modern Approach, 5th Ed, Cengage Learning, 2013