Course Code	Course Name	Credits
26EC512	ADVANCE ECONOMETRICS	04

Course Objectives

- To enable students to define, and explain the fundamental concepts of econometric theory and models.
- To develop the ability to analyze and differentiate the outcomes of empirical economic and time series analysis
- To understand the use of qualitative variables in regression analysis through Dummy Variables
- Enable the use of simultaneous equation model in the real world
- To enable students to evaluate econometric results and apply/synthesize econometric models in their academic work.

Learning Outcomes

Upon successful completion of this course it is intended that a student will be able to:

- Explain econometric techniques used for economic data, including linear and multiple regression models.
- Understand the time series analysis and its modelling
- Apply regression analysis using the Ordinary Least Squares (OLS) estimator.
- Analyze and interpret the results of empirical economic models.
- Apply and analyze different lag models in real-life economic problems.

Unit 1 – Introduction to Econometrics (12Hrs)

Origin, definition, objectives and scope of econometrics, limitations of econometrics, methodology of econometrics research, Linear regression model (LRM), Regression analysis and estimation: concept of regression, Correlation and regression

Unit 2 –Time Series and Modeling (12Hrs)

Stationary stochastic process – Random walk and white noise, Unit Root Stochastic Processes Dickey-Fuller test and Augmented Dickey-Fuller test, Integrated Stochastic Processes, Spurious Regression, Co- integration, Engle-Granger test, Approaches to Economic Forecasting- AR, MA and ARIMA (Autoregressive Integrated Moving Average), Box-Jenkins Methodology, Vector Auto-regression (VAR), Problems with VAR modeling.

Unit 3 – Dummy Variable and Dynamic Econometric Model Data (12Hrs)

Dummy variable regression model, use of dummy variable, Auto-regressive model, distributed lag model, Koyck model, partial adjustment model, adaptive expectation model, Instrumental variable, causality test; Granger causality test

Unit 4 – Simultaneous Equation Model (12Hrs)

Simultaneous Equation Model, simultaneous bias, The Identification Problem – under identified, just or exact identification, over identification, Rules of Identification - Order and Rank conditions of identification. Approaches to simultaneous-equation methods- Estimation, Recursive methods and OLS. Estimation of just identified equation - ILS, Estimation of over identified equation- 2SLS.

Unit 5 –Panel Data Technique (12Hrs)

Introduction to panel data, Estimation of Panel Data Regression Models- Fixed Effects Model and Random Effects Model. Fixed versus Random Effects. Test of Simultaneity-Hausman Specification Test, Breusch and Pagan Test.

Reference Books:

1. Hill, R.C; Griffiths, W.E, and Lim, G.C. (2017). Principles of Econometrics (5th Edition). John Wiley and Sons, Inc (HGL)
2. Koutsoyiannis A. (19977) Theory of Econometics (2nd Edition), the Macmillan Press Ltd, London.
3. Verbeek, M. (2017). A Guide to Modern Econometrics. 5th Ed. Wiley.
4. Brooks, C. (2019). Introductory Econometrics for Finance. 4th edition. Cambridge University
5. Asteriou, D. and Hall, S. (2016). Applied Econometrics 3rd ed. Palgrave Macmillan.

Websites and eLearning Sources:

1. https://www.econometrics-with-r.org/references.html
2. https://www.econometricsbooks.com/
3. https://www.econometrics-with-r.org/
4. https://onlinelibrary.wiley.com/doi/book/10.1002/9780470996249

COs and Bloom's Taxonomy Mapping – 26EC512		
Course Outcomes	**On successful completion of this course, students will be able to**	**BTL**
CO1	Understand the fundamentals of econometrics, and recall the concept of regression, correlation, and the methodology of economic research.	K1, K2
CO2	Analyze time series data using models such as AR, MA, ARIMA, VAR, and apply stochastic process	K4, K3
CO3	Apply dummy variable techniques and its uses in regression analysis and dynamic econometric models such as autoregressive and distributed lag models.	K3
CO4	Evaluate and estimate simultaneous equation models using identification conditions like ILS and 2SLS approach. and understand lag models	K5
CO5	Apply panel data techniques including fixed effects and random effects models, and conduct specification tests and its application for future inferences.	K3

BTL (Bloom's Taxonomy Level) - K1 – Remembering, K2 – Understanding, K3- Applying, K4 – Analyse, K5- Evaluate and K6 - Create

Relationship Matrix – 26EC512												
Course Outcomes	**Programme Outcomes (POs)**						**Programme Specific Outcomes (PSOs)**					**Mean Score of Cos**
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**	
CO1	3	3	2	3	1	1	3	2	2	1	1	2.00
CO2	3	3	3	3	2	1	3	3	3	1	1	2.36
CO3	3	3	3	3	2	1	3	3	3	2	1	2.45
CO4	3	3	3	3	2	1	3	3	3	2	1	2.45
CO5	3	3	3	3	2	2	3	3	3	1	1	2.27
											Total	2.30

Mean Score: 3- High, 2- Medium/Moderate, 1-Low