

Name of the Programme: M.A. Economics

Course Code: ECO-604

Title of the Course: Time Series Econometrics

Number of Credits: 4

Effective from AY: 2022-23

Prerequisites for the Course:	Understanding of probability, statistics and basic Econometrics or equivalent	
Objective:	Equip the students to analyse time series data	Contact Hours per module

Content:	<p>Module 1</p> <p>Basic Regression Analysis with Time Series Data: The Nature of Time Series Data, Static Models, Finite Distributed Lag Models, A Convention about the Time Index, Finite Sample Properties of OLS under Classical Assumptions, Functional Form, Dummy Variables, and Index Numbers, Trends and Seasonality, Characterizing Trending Time Series, Using Trending Variables in Regression Analysis, A Detrending Interpretation of Regressions with a Time Trend. Stationary and Weakly Dependent Time Series, Highly Persistent Time Series, Transformations on Highly Persistent Time Series, Dynamically Complete Models and the Absence of Serial Correlation</p> <p>Module 2</p> <p>Serial Correlation and Heteroskedasticity in Time Series Regressions: Properties of OLS with Serially Correlated Errors, Serial Correlation in the Presence of Lagged Dependent Variables, Testing for Serial Correlation, The Durbin-Watson Test under Classical Assumptions, Testing for AR(1) Serial Correlation without Strictly Exogenous Regressors, Testing for Higher Order Serial Correlation, Correcting for Serial Correlation with Strictly Exogenous Regressors, Feasible GLS Estimation with AR(1) Errors, Comparing OLS and FGLS, Correcting for Higher Order Serial Correlation, Differencing and Serial Correlation, Serial Correlation-Robust Inference after OLS, Heteroskedasticity in Time Series Regressions, Heteroskedasticity-Robust Statistics, Testing for Heteroskedasticity Autoregressive Conditional Heteroskedasticity, Heteroskedasticity and Serial Correlation in Regression</p> <p>Module 3</p> <p>Models Pooling Cross Sections across Time: Simple Panel Data Methods, Pooling Independent Cross Sections across Time, The Chow Test for Structural Change across Time, Policy Analysis with Pooled Cross Sections, Two-Period Panel Data Analysis, Organizing Panel Data, Policy Analysis with Two-Period Panel Data, Differencing with More Than Two Time Periods, Fixed Effects Estimation, The Dummy Variable Regression, Fixed Effects or First Differencing? Fixed Effects with Unbalanced Panels, Random Effects</p>	<p>15 hours</p> <p>15 hours</p> <p>15 hours</p>
----------	---	---

	<p>Models, Random Effects or Fixed Effects? The Correlated Random Effects Approach, Applying Panel Data Methods to Other Data Structures</p> <p>Module 4</p> <p>Simultaneous Equations Models: The Nature of Simultaneous Equations Models, Simultaneity Bias in OLS, Identifying and Estimating a Structural Equation, Identification in a Two-Equation System, Estimation by 2SLS, Systems with More Than Two Equations, Identification in Systems with Three or More Equations, Estimation of Simultaneous Equations Models with Time Series, Simultaneous Equations Models with Panel Data, Infinite Distributed Lag Models, The Geometric (or Koyck) Distributed Lag, Rational Distributed Lag Models, Testing for Unit Roots, Spurious Regression, Cointegration and Error Correction Models, Cointegration, Error Correction Models, Forecasting, Types of Regression Models Used for Forecasting, One-Step-Ahead Forecasting, Comparing One-Step-Ahead Forecasts, Multiple-Step-Ahead Forecasts, Forecasting Trending, Seasonal, and Integrated Processes</p>	15 hours
Pedagogy:	<ul style="list-style-type: none"> ● Chalk and talk aided by ICT enabled lectures ● PC lab exercises ● Assignments and presentations ● Group activity ● MOOC (or similar) Component 	
Reference/Readings:	<p>Core Reading</p> <p>C1. Wooldridge, J. (2018). <i>Introductory econometrics: A modern approach</i> (7th edition). Cengage Learning.</p> <p>Additional Reading</p> <p>A1. Angrist, J. D., & Pischke, J.-S. (2009). <i>Mostly harmless econometrics: An empiricist's companion</i>. Princeton University Press.</p> <p>A2. Heiss, F. (2020). <i>Using R for introductory econometrics..</i></p>	

Learning Outcomes:	<p>On successful completion, students will be able to:</p> <ul style="list-style-type: none"> a) Undertake advanced analysis of time series econometric tools b) Use econometric software with an emphasis on open source for data and graphics c) Explore differences in analytical approached of cross-section and time-serires data 	
---------------------------	---	--