Programme : M.Com.
Course Code **: COO438**
Course Title **: Advanced Econometrics**
Number of Credits : 4
Effective from AY : 2020-21

Need of the Course	: A significant amount of empirical research work in finance that facilitates policy making at macroeconomic level and management of risk at individual and institutional level transactions is well supported by the discipline of econometrics. However it is important to acquire skills in using advanced tools and techniques available in the field of econometrics and hence the need for this course in advanced econometrics.
Description of the Course	: Advanced econometrics develops on the basics of financial econometrics course and extends to the study of advanced econometric models with applications in cross-section, time series and panel data. Special advanced regression models designed for limited dependent variable, advanced multivariate time series models with vector autoregression specification, models for examining long-run relationship between variables of interest are covered in this course. Similarly, advanced volatility models and panel data econometrics with detailed procedures for identifying right panel data models are also included in this course.
Objectives of the Course	: (i) To enable learners apply cross-section regression models on limited dependent variables. (ii) To enable learners acquire skills in time series modelling and forecasting with advanced analytical techniques for short term and long-term relationships in variables of interest. (iii) To enhance skills in estimation and forecasting of volatility. (iv) To provided skills in building panel data models for examining dependency relationships amongst financial variables.

Course Content		
Unit 1	**:Limited Dependent Variable Models**	**12 Hours**
Nature – Linear Probability Model – Limitations of LPM – Logit and Probit Models: Structure and specifications, Estimation, Interpretations, Computing marginal effects – Tobit Model: estimations and specification issues.		
Unit 2	**: Multivariate Time Series Analysis**	**12 Hours**
Vector autoregressive (VAR) models – Estimation and forecasting with VAR – Forecast error variance decomposition - Impulse response function – Generalized VAR - Forecasting with VAR models - Granger causality test – VAR based Granger causality test – Johansen Co-integration test – VECM model – ARDL model.		
Unit 3	**: Advanced Volatility Models**	**12 Hours**
Multivariate GARCH and conditional correlations models – Constant and Dynamic Conditional Correlations models – BEKK GARCH model – Stochastic volatility models: Concept, structure, Kalman		

filter.		
Unit 4	**: Panel Data Econometrics**	**12 Hours**
Panel data structure – Advantages of Panel Data –Pooled OLS Regression – Fixed Effects model – Random effects model – Properties of Various Estimators - Fixed Effects versus Random effects model – Wald test - Breush and Pagan Lagrange Multiplier Test – Hausman Test – Non-Stationary Panel - Panel unit root and cointegration tests.		
Pedagogy	: lectures/ case analysis/assignments/class room interaction/lab	
Reference/Readings	1. Fabozzi, F., Focardi, S., Rachev, S. and Arshanapalli, B. (2014) The Basics of Financial Econometrics: Tools, Concepts and Asset Management, Wiley. 2. Guidolin, M. and Pedio, M. (2018) Essentials of Time Series for Financial Applications, Academic Press, UK. 3. Asteriou Dimitrious,(2006), Applied Econometrics, Palgrave Macmillan, New York 4. Cameroon Samuel (2005), Econometrics, McGraw Hill, New York. 5. Davidson, J. (2000) Econometric Theory, Blackwell, USA 6. Goldberger, A.S. (2000) Introductory Econometrics, Harvard University Press, Cambridge. 7. Greene, W. (2004) Econometric Analysis, Prentice Hall, New York. 8. Gujarati, D. (2004) Basic Econometrics, McGraw Hill, New Delhi. 9. Hayashi, F (2000), Econometrics, Princeton University Press, Princeton. 10. Pattreson, Kerry (2000) An Introduction to Applied Econometric: Time Series Approach, Palgrave Macmillan, New York 11. Wooldridge (2006), Introductory Econometrics, Thomson-South Western, Singapore.	
Course Outcome	: Upon completion of the course learners will be able to: **CO1** Apply probability based models including LPM, logit and probit models to data in social sciences. **CO2** Perform forecasting by developing VAR models. **CO3** Estimate Granger causality models including the VAR framework. **CO4** Develop models for examining long-run relationship between financial variables using Johansen's cointegration and ARDL models. **CO5** Forecast financial market volatility using advanced GARCH volatility models and Kalman filter. **CO6** Demonstrate ability to develop useful panel data models with appropriate diagnostic procedures.	

Online Resources	https://www.youtube.com/user/econometricsacademy https://www.youtube.com/user/patobi1 https://sites.google.com/site/econometricsacademy/home https://www.economicsnetwork.ac.uk/teaching/Online%20Text%20and%20Notes/Econometrics https://www.ssc.wisc.edu/~bhansen/econometrics/Econometrics.pdf https://otexts.com/fpp2/arima.html https://online.stat.psu.edu/stat510/