

THE UNIVERSITY OF THE WEST INDIES
MONA CAMPUS
Department of Economics
Kingston 7
Jamaica, W.I.

ECON9006: Advanced Econometrics II

Academic year:	Semester 2, 2020/2021
Pre-requisite:	ECON9005
Lecture hours:	Wednesdays 3–6 pm (online)
Lecturer:	Dr. Alrick K. Campbell
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Office location:	Alister McIntyre Building, E207
Office hours:	Tuesdays 11am – 1pm, Wednesdays 11am – 12pm

Course Description

This course provides students with a survey of the theory and application of time series methods in econometrics. The course is intended to serve as a building block in applied economic analysis. Students will learn to read, write and combined data; how to extract and manage data from large data sources; how to manipulate and prepare date for research purposes and how to address common data problems, such as missing data. The course will mainly focuses on univariate time series (stationary and non-stationary models) and multivariate time series (stationary and non-stationary models). The course will also cover different methods of estimation and inferences of modern dynamic stochastic general equilibrium models (DSGE): maximum likelihood and Bayesian approach. The empirical applications in this course will be drawn primarily from macroeconomics.

Learning Outcomes

Upon successful completion of the course, the student should be able to:

1. Read and write data using a variety of formats
2. Extract, clean and manipulate data for economic analysis
3. Handle the challenges of dealing with large data sets and complex data structure
4. Detect and manage missing data
5. Describe data, conduct basic analysis and present results
6. Analyze applied and theoretical econometric problems
7. Use Vector Autoregression models for multivariate stationary analysis
8. Deal with issues of cointegration in time series data

9. Estimate and draw inferences from modern dynamic stochastic general equilibrium models (DSGE)
10. Conduct estimations in the presence of structural break and non-linearity
11. Utilize the Markov Chain Monte Carlo (MCMC) algorithm to sample from a probability distribution

Course Content

This course is divided into six (6) units as follows:

Unit I – Introduction: Stationary Time Series

1. Wold decomposition theorem
2. Difference equations
3. ARMA models and Box-Jenkins methodology
4. Model Selection
5. Forecasting

Unit II – Multivariate Stationary Analysis

6. Dynamic simultaneous equations models
7. Vector autoregression (VAR) models
8. Granger causality
9. Impulse response functions
10. Variance decompositions
11. Structural VAR models

Unit III – Univariate Non-Stationary Processes

12. Trend/Cycle decomposition
13. Beveridge-Nelson decomposition
14. Deterministic and stochastic trend models
15. Unit root tests
16. Stationarity tests

Unit IV – Multivariate Non-Stationary

17. Spurious regression
18. Cointegration, Granger representation theorem
19. Vector error correction models (VECMs)
20. Structural VAR models with cointegration
21. Testing for cointegration
22. Estimating the cointegrating rank
23. Estimating cointegrating vectors

Unit V – Likelihood Methods

24. State-Space models and Kalman filter
25. ML estimation of DSGE
26. Identification and weak identification of DSGE

Unit VI – Bayesian Methods

27. Bayesian concepts
28. Markov Chain Monte Carlo (MCMC)
29. Estimation of DSGE models using Bayesian methods

Mode of Delivery

Three hours of lectures per week. Some of these lecture hours will be used for problem solving sessions.

Assessment

To establish student understanding of the course material and encourage ongoing engagement in the course, several assessment strategies will be utilised throughout delivery of this course. The assessment summary is provided below:

Assessment Items	Mode of Submission	Weighting
Five (5) graded problem sets (10% each)	Online	50%
Replication of an empirical econometrics paper	Online	50%
Total		100%

Student Responsibility

Your regular attendance at lectures and participation in tutorials is expected. All communication about this course will be made through the OurVLE course site and/or your official email provided by the University. Announcements made via OurVLE and your official email are deemed to be made to the entire class.

Resources

Required Text

- Hamilton, James D (1994) Time Series Analysis. Princeton University Press, Princeton, NJ
- Greene, W. H. (2007) Econometric Analysis, Prentice Hall, Upper Saddle River, New Jersey

Recommended Text

- DeJong, David and Chetan Dave(2011), Structural Macroeconometrics 2nd Edition, Princeton University Press, Princeton, NJ
- Davidson, Russell and James G. MacKinnon (1993) Estimation and Inference in Econometrics, Oxford University Press, New York, NY