

## **DEREE COLLEGE SYLLABUS FOR:**

### **EC 4753 ECONOMETRICS – LEVEL 6**

**UK CREDITS: 15**

**3/1/3**

(Updated Spring 2015)

**PREREQUISITES:** EC 1000 Principles of Microeconomics  
EC 1101 Principles of Macroeconomics  
MA 1105 Applied Calculus  
MA 1108 College Algebra  
MA 2010 Statistics I  
MA 3111 Statistics II  
EC 4636 Applied Methods in Economics

### **CATALOG**

**DESCRIPTION:** The multiple regression model. Ordinary Least Squares Estimation. Violation of assumptions: heteroskedasticity, autocorrelation, multicollinearity. Econometric applications: further diagnostics, Methods of Estimation. Time-Series analysis, Stationary variables. Volatility Models, Vector Auto Regression Forecasting.

**RATIONALE:** Economics is essentially empirical in nature. This course deals with the methods used by economists and financial analysts to quantify economic relationships and evaluate the validity of theoretical generalizations. This course would be of interest to senior students in economics and finance and it is an essential prerequisite for graduate studies in economics and finance.

**LEARNING OUTCOMES:** As a result of taking this course, a student should be able to:

1. Formulate an economic hypothesis in a form suitable for econometric testing.
2. Apply econometric methods to obtain numerical estimates of the coefficients of the economic relationships.
3. Construct an appropriate set of criteria to establish whether the theory is consistent with the facts.
4. Examine whether or not the quantitative results can be trusted and what estimation methods to use under different conditions.
5. Compile a paper involving collection of data, specification of a model, testing and discussion of the economic implications.
6. Demonstrate ability in applying econometric techniques in the context of real world empirical problems.

### **METHOD OF TEACHING AND LEARNING:**

In congruence with the learning and teaching strategy of the college, the following tools are used:

- Classes consist of lectures, problem-solving sessions, and class discussions of recent articles in economic journals assigned by the instructor.

- Laboratory practice sessions: One and a half hours per week practice through software in understanding the material through real world empirical problems and self-testing assignments.
- Office hours: students are encouraged to make full use of the office hours of their instructor, where they can ask questions and go over lecture material.
- Use of a blackboard site, where instructors post lecture notes, assignment instructions, timely announcements, as well as additional resources.

## ASSESSMENT:

In-class, 1-hour, "diagnostic" test - <b>formative</b>	0	Numerical problems/interpretation of results
Research paper (1800 -2200 words) - <b>summative</b>	40	Data collection/methodology/interpretation
Final examination (2-hour, comprehensive) - <b>summative</b>	60	Numerical problems/interpretation of results

The formative assessment prepares students for the final examination.

The research paper tests Learning Outcomes 5, 6

The final examination tests Learning Outcomes 1 -4

## READING LIST:

### 1. Required Texts:

Brooks, Chris, Introductory Econometrics for Finance, Cambridge University Press, latest edition

R. Carter, Hill, W., Griffiths and G.Judge, Undergraduate Econometrics, Wiley, latest edition

### 2. Suggested Textbooks

Andreas Merikas and Anna Merika. Econometrics for Financial Analysis: With E-Views Applications, 1<sup>st</sup> edition, Papazisis publications, Athens, 2006.

### 3. Further Reading:

Aneuryn-Evans, G., and A. Deaton "Testing Linear Versus Logarithmic Regression Models". *Review of Economic Studies*, 47, 1980, pp. 275-291

Beck, S.E., "Cointegration and Market Efficiency in Commodities Futures Markets". *Applied Economics* 26 (3), 249-257, 1994.

Buse, A. "The Likelihood Ratio, Wald, and Lagrange Multiplier Tests: An Expository Note" *American Statistician*, 36, 1982, pp.153-157.

Campbell, J., and G. Mankiw. "Consumption, Income, and Interest Rates: Reinterpreting the Time Series Evidence" *Working Paper* 2924, NBER, Cambridge, MA, 1989.

Daniel McFadden,. "Economics Choices". *AER*, June 2001.

Edward E. Leamer, "Let's Take the Con Out of Econometrics." *AER* March 1983.

Granger, Cliver W.J. and Allan Timmerman 'Efficient Market Hypothesis and Forecasting', *International Journal of Forecasting*, 20(1) 2004, pp. 15-27.

Hamilton, J.D. and Lin, G., "Stock Market Volatility and the Business Cycle" *Journal of Applied Econometrics* 11 (5), 573-593, 1996.

Terasvirta, T. "An Introduction to Univariate GARCH models" *SSE/EFI Working Papers in Economics and Finance No. 646*, 2006.

Zivot, E. and Andrews, D.W.K., "Further Evidence on the great crash, the oil price shock and the unit root hypothesis" *Journal of Business and Economic Statistics* 10, 251-270, 1992.

**WWW RESOURCES:** [www.SSRN.com/](http://www.SSRN.com/) (economics research institute papers)  
[www.ssrn.com/link/Yale-ICF.html](http://www.ssrn.com/link/Yale-ICF.html)  
(Yale International center for finance working papers- abstracts)  
[www.ssrn.com/link/CCESifo.html](http://www.ssrn.com/link/CCESifo.html)  
(Center for Economic Studies & Ifo Institute for economic research-paper abstracts)  
[www.ssrn.com/link/econometrics.html](http://www.ssrn.com/link/econometrics.html)  
(econometrics abstracts. working paper series)

**SOFTWARE REQUIREMENTS:** Word, EXCEL, E-VIEWS (econometrics software)

**COMMUNICATION REQUIREMENTS:** Project submitted in Word and E-VIEWS

**INDICATIVE CONTENT:**

1. The Multiple Regression Model
  - 1.1 OLS Estimation
  - 1.2 Hypotheses Testing-Diagnostics
  - 1.3 Case Study Application
2. Violation of basic assumptions
  - 2.1 Heteroskedasticity
  - 2.2 Autoregressive disturbances
  - 2.3 Multicollinearity
  - 2.4 Case Study Application
3. Econometric applications
  - 3.1 Further Diagnostics
  - 3.2 Specification errors, identification, errors in measurement
  - 3.3 Other Methods of Estimation  
ML, IV, 2SLS
  - 3.4 Case Study Application

- 4. Stationary and Non-Stationary Variables
  - 4.1 Testing for Unit Roots
  - 4.2 Cointegration
  - 4.3 Links between cointegration and error correction models
  - 4.4 Case Study Application
- 5. Vector Autoregressive Models
  - 5.1 Case Study Application
- 6. Volatility Models
  - 6.1 ARCH
  - 6.2 GARCH
  - 6.3 Case Study Application
- 7. Forecasting
  - 7.1 Case Study Application
- 8. Discussion on econometric papers involving computer work