B.E. International Program

Faculty of Economics, Thammasat University

Course Outline

EE 425 Econometrics 1

Semester 1/2012 (August 14 – December 1, 2012)

Number of credits: 3 credits

Lecture Time: Wednesdays and Fridays, 11.00 – 12.30 hrs

Lecture Venue: Room 203, Faculty of Economics

Instructor: Professor Dr. Pranee Tinakorn

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Office hours: Tuesdays and Wednesdays 14.00 – 16.00 hrs

Course Description:

The application of statistical and economic theories to analyze economic data, including parameter estimation using ordinary least squares (OLS) technique and hypothesis testing. The simple and multiple regressions. Estimations of parameters when independent variables consists of dummy variable. An examination of problems in regression model, including autocorrelation, heteroskedasticity, multicollinearity, specification error, and stochastic regressor. Other estimation techniques such as generalized least squares (GLS), maximum likelihood, and comparison between various techniques; The use of computer application in practice to analyze econometric models.

Note: Since the analysis of the multiple regression model (or general linear model) will involve matrix algebra, students should have taken MA217 or have some basic knowledge about matrix manipulation.

Prerequisites: *MA216 (or MA211) and ST217 (or ST212)*

Course Objectives:

To provide students with statistical tools and econometric knowledge to quantitatively analyze economic phenomena. Economic theory makes statements and hypotheses that are mostly quantitative in nature and econometric analysis uses mathematics and statistical tools to give empirical content to economic theory.

Main Textbooks:

Gujarati, D.N., and D.C. Porter***, Basic Econometrics***, 5th ed., N.Y., McGraw-Hill, 2009.

Other references for further reading:

Dougherty, C. ***Introduction to Econometrics***. 3rd ed. Oxford University Press: Oxford, 2007.

Wooldridge, J. M. ***Introductory Econometrics: A Modern Approach***. 3rd ed. Thompson: South-Western, 2006.

Course Schedule:

Number of Lecture Hours	Lecture Topic / Activities
3 hours	**1. Introduction and Review of Statistical Concepts** 1.1 What is econometrics 1.2 Methodology of econometrics 1.3 Types of economic data 1.4 Random variables and distributions 1.5 Sampling and estimators 1.6 Estimators and desirable properties of estimators (Gujarati and Porter, ch. 1: Appendix A, pp.869-912; Wooldridge, ch. 1)
8 hours	**2 Simple Regression Models** 2.1 Principle, assumptions and derivation of ordinary least squares (OLS) estimators 2.2 Properties of OLS estimators 2.3 Statistical inference 2.4 Coefficient of determination and Best linear unbiased predictor 2.5 Normality assumption and the maximum likelihood estimator (MLE) (Gujarati and Porter, chs. 2 – 5)

Number of Lecture Hours	Lecture Topic / Activities
3 hours	**3 Extensions of the Simple Regression Model** 3.1 Regression through the origin 3.2 Scaling and units of measurement 3.3 Functional forms of regression models (Gujarati and Porter, ch. 6)
8 hours	**4 Multiple Regression Analysis (General Linear Model)** 4.1 Model and assumptions 4.2 Estimation of parameters and properties of estimators 4.3 Meaning of partial regression coefficients 4.4 The matrix approach to the general linear model 4.5 Measuring goodness of fit: R^2 and adjusted R^2 (Gujarati and Porter, ch. 7; Appendix B, C)
5 hour	**5 Statistical Inference in the General Linear Model** 5.1 Sampling distribution of OLS estimators 5.2 Test on individual regression coefficients 5.3 Testing the overall significance of the sample regression 5.4 Testing the equality of two regression coefficients 5.5 Testing linear restriction 5.6 Testing for equality or stability of parameters (Chow test) 5.7 Prediction with the general linear model (Gujarati and Porter, ch. 8)
4 hours	**6 Dummy Variable Regression Models** 6.1 Qualitative information and Nature of dummy variables 6.2 Use of dummy variables in cross-sectional data 6.3 Use of dummy variables in time series data 6.4 Dummy variable alternative to the Chow test 6.5 Interaction effects using dummy variables 6.6 Use of dummy variables in seasonal analysis 6.7 Piecewise linear regression (Gujarati and Porter, ch.9)
3 hours	**7 Multicollinearity Problem** 7.1 Nature of problem 7.2 Consequences of multicollinearity 7.3 Detection of multicollinearity 7.4 Remedial measures (Gujarati and Porter, ch. 10)
3 hrs	**8 Heteroscedasticity problem** 8.1 Nature of problem 8.2 Consequences of heteroscedasticity 8.3 Detection of heteroscedasticity 8.4 Remedial measures (Gujarati and Porter, ch. 11)

Number of Lecture Hours	Lecture Topic / Activities
3 hrs	**9 Autocorrelation problem** 9.1 Nature of problem 9.2 Consequences of autocorrelation 9.3 Detection of autocorrelation 9.4 Remedial measures (Gujarati and Porter, ch. 12)
2 hrs	**10 The Method of Generalized Least Squares (GLS)**
3 hrs	**11 Specification Errors** 11.1 Type of specific errors 11.2 Consequences of specification error 11.3 Tests of specification error 11.4 Errors of measurement 11.5 Incorrect specification of the stochastic error term (Gujarati and Porter, ch. 13)
3 hrs	**12 Stochastic Regressors** 12.2Nature and Consequence of stochastic regressors 12.3Asymptotic properties of estimators 12.4Instrumental variables (IV) method (Dougherty, ch.8.1-8.3, Wooldridge, ch.5)

Course Evaluation:

	Evaluation Method		Activities	Evaluation Date
1.	Homework and Exercise	(20%)	Answers to problem sets	Every month
2.	Midterm Examination	(30%)	Written Examination	Wednesday, October 3, 2012 (11.00 – 12.30 hrs)
3.	Final Examination	(50%)	Written Examination	Thursday, December 20, 2012 (9.00 – 12.00 hrs)

Important Dates:

Classes Begins	August 14, 2012
Adding and Dropping Courses	August 14 – 28, 2012
Midterm Exam Period	October 1 – 6, 2012 (No Lectures)
Course Withdrawal with "W"	October 17 – 22, 2012
Class Ends	December 1, 2012