



B.E. International Program

Faculty of Economics, Thammasat University



Course Outline

EE 425 Econometrics 1

Semester 1/2015 (August 17– December 4, 2015)

Number of credits: 3 credits

Lecture Time: Tuesdays and Thursdays, 12.30-14.00

Lecture Venue: Room 203, Faculty of Economics

Instructor: Professor Dr. Pranee Tinakorn

Office: Room 452, Faculty of Economics

E-mail: pranee@econ.tu.ac.th

Office hours: Tuesdays and Thursdays 14.00 – 15.30

Course Objective:

The objective of this course is to provide students with statistical tools and econometric analysis so that students can understand the foundations of econometric theory and its applications. Economic theory makes statements and hypotheses that are mostly qualitative in nature and econometric analysis uses mathematics and statistical tools to give quantitative or empirical content to economic theory. With understanding in econometric methods, students can properly use them in his/her research work.

Course Description:

Applying statistical and economic theories to analyze economic data, including parameter estimation using the ordinary least squares (OLS) technique and hypothesis testing; simple and multiple regressions; estimations of parameters when independent variables consist of the dummy variable; examining problems in regression models, including autocorrelation, heteroscedasticity, multicollinearity, specification error, and stochastic regressors; other estimation techniques such as generalized least squares (GLS), maximum likelihood, and comparing different techniques; using computer applications 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)

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.

Stewart, K. G. *Introduction to Applied Econometrics*. Thompson: Brooks/Cole, 2005.

Wooldridge, J. M. *Introductory Econometrics: A Modern Approach*. 4th ed. Thompson: South-Western, 2009.

Lecture Plan :

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; Wooldridge, ch. 1)
6 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)
7 hours	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 hours	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)
3 hours	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)
Number of Lecture Hours	Lecture Topic / Activities
2 hours	10 The Method of Generalized Least Squares (GLS)
3 hours	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 hours	12 Stochastic Regressors 12.2 Nature and Consequence of stochastic regressors 12.3 Asymptotic properties of estimators 12.4 Instrumental variables (IV) method (Dougherty, ch.8.1-8.3, Wooldridge, ch.5)

Course Evaluation:

	Evaluation Method	Activities	Evaluation Date
1.	Homework and Tests (20%)	Answers to problem sets	Every month
2.	Midterm Examination (30%)	Written Examination	Thursday, October 8, 2015 (12.30-14.00)
3.	Final Examination (50%)	Written Examination	Wednesday, December 9, 2015 (9.00 – 12.00)

Important Dates:

Classes Begins	August 17, 2015
Adding and Dropping Courses	August 17 – 31, 2015
Midterm Exam Period	October 5 – 10, 2015 (No Lectures)
Midterm Exam	October 8, 2015 (12.30 – 14.00)
Course Withdrawal with “W”	October 21 – 26, 2015
Last Day of Classes	December 4, 2015
Final Exam	December 9, 2015 (9.00 – 12.00)