Course Outline

EE425 Econometrics 1

Semester 1/2023 (August 15 - December 4, 2023)

Lecture Time: Thursday, 09.00-12.00 hours

Lecture Venue: Meeting Room 6/2, 4th Floor

Teaching Materials Platform: Google Classroom: nqo3t5w

Instructor:

Name: Asst. Prof. Dr. Monthien Satimanon

Office Hours: By appointment

Email: monthien@econ.tu.ac.th

Phone: 662-613-2478

Number of Credits: 3 Credits (3-0-6)

Prerequisite: EE211 (or EE213), EE212 (or EE214), MA216 (or MA211) and ST216 (or ST211)

Course Description:

Applying statistical methods and economic theories to analyze economic data, including simple and multiple regressions; Estimation using the ordinary least squares (OLS) hypothesis testing; and dummy variable. This course also examines various problems in regression models, including Multicollinearity, Heteroscedasticity, Autocorrelation, Specification Error, Stochastic Regressors, and some advanced topics in regression methods such as Generalized Least Squares (GLS) estimation, System of regressions, and Seemingly Unrelated Regression (SUR), Simultaneous Equation System and solving Endogeneity problem with instrumental variables—training in econometrics software.

Course Objectives:

This course is the more advanced alternative to EE325

(Introductory Econometrics). It will focus on the theory that underpins standard econometric methods. Students will learn to derive simple theoretical results from standard principles. They will also learn to apply the knowledge to analyze actual datasets using standard software such as STATA®.

Expected Learning Outcomes

1. Morality and Ethics EE425

Applicability	Expected Learning Outcomes	Evaluation Method
~	1. Students demonstrate integrity.	
š	2. Students prioritize social and public benefits over personal ones.	
~	3. Students are punctual and comply with the code of conduct of the institution and society at large.	
š	4. Students are responsible and accountable to society, the nation, and the subject of economics.	
š	5. Students realize the cultural and environmental value of a sustainable society.	

2. Knowledge

Applicability	Expected Learning Outcomes	Evaluation Method
~	1. Students know and understand modern economics principles and theories and are up to date with new developments.	
~	2. Students know and understand Thai and global economic structures and the importance of major international economic events.	
~	3. Students know and understand the instruments of economic analysis.	
~	4. Students know and understand applied fields in economics, including monetary, public, international, business, natural resource, environmental, industrial, agricultural, cooperative, political, developmental, and entrepreneurial economics, and agribusiness.	

š	5. Students are informed about related fields, including sociology, business administration, education, law policy, and science.	

3. Intellectual Development

Applicability	Expected Learning Outcomes	Evaluation Method
~	1. Students have developed individual critical thinking.	
~	2. Students are sufficiently trained in research skills.	
~	3. Students demonstrate an ability to analyze and synthesize data and appropriately integrate economic concepts to understand the causes of current economic problems in Thailand. Based on analysis and synthesis, students demonstrate an ability to propose policy guidelines to resolve problems.	

4. Interpersonal Skills and Responsibilities

Applicability	Expected Learning Outcomes	Evaluation Method
~	1. Students are responsible for assigned tasks and work in groups effectively.	
~	2. Students have problem-solving skills.	
š	3. Students show leadership skills and team spirit.	
~	4. Students are continuously improving themselves.	
š	5. Students have good interpersonal skills, adapt, and work under different conditions.	

5. Quantitative Analysis, communication, and information technology

Applicability	Expected Learning Outcomes	Evaluation Method
~	1. Students select and apply appropriate statistical and mathematical methods for data processing, interpretation, conclusions, and recommendations to resolve problems.	

š	2. Students communicate effectively and select appropriate presentation methods.	
˜	3. Students use information and communication technologies appropriately to gather data and process, interpret, and present results.	

Remark: ˜ Primary expected outcome š Secondary expected

Main Text:

Wooldridge, J. M. Introductory Econometrics: A Modern Approach. 7th ed. Cengage, 2019.

Recommended Texts & Materials:

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

Suggested Readings:

Heiss, F. (2016). Using R for introductory econometrics (pp. 216-217). Düsseldorf, Germany: Florian Heiss.

Heiss, F. (2023). Using Python for introductory econometrics (pp. 216-217). Düsseldorf, Germany: Florian Heiss.

Grading Criteria:

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Homework 20%

Paper Replication 20%

Midterm Exam 25%

Final Exam 35%

***If there is any handout or additional reading, I will post them Google Classroom prior to class. Students must review the topic ahead of the class for more effective learning.**

Tentative Class Schedule:

Introduction

- What is econometrics?
- Methodology of econometrics
- Types of economic data (Wooldridge, ch.1; Gujarati, ch. 1)

Review of Some Statistical Concepts

- Random variables and distributions
- Expectation, variance, covariance, and correlation
- Estimators and desirable properties of estimators (Wooldridge, Appendix B; Gujarati, Appendix A, pp.869-912)

Simple Regression Models

- Principle, assumptions and derivation of ordinary least squares (OLS) estimators
- Properties of OLS estimators
- Statistical inference
- Prediction
- Regression Through the Origin (Wooldridge, ch. 2; Gujarati, chs. 2 – 6)

Multiple Regression Analysis (Estimation)

- Motivation
- Model and assumptions
- Estimation of parameters and properties of estimators
- Meaning of partial regression coefficients
- Measuring goodness of fit: R2 and adjusted R2
- The matrix approach to linear regression model (Wooldridge, ch. 3; Gujarati: ch. 7, Appendix B, C)

Multiple Regression Analysis (Inference)

- Sampling Distribution of the OLS estimators
- Test on individual regression coefficients
- Testing the multiple linear restrictions
- Testing the equality of two regression coefficients
- Testing for equality or stability of parameters (Chow test)
- Prediction with general linear Model (Wooldridge, ch. 4; Gujarati: ch. 8)

========== MIDTERM EXAM ABOUT HERE ==========

Multiple Regression Analysis (Extensions)

- Data scaling on OLS statistics
- More on functional forms (Wooldridge, ch. 6, (6.1 and 6.2))

Dummy Variable Regression Models

- Describing Qualitative Information
- Models with a single dummy independent variable
- Using dummy variables for multiple categories
- Interactions involving dummy variables (Wooldridge, ch. 7; Gujarati: ch. 15)

Heteroscedasticity Problem

- Nature and Consequences of Heteroscedasticity for OLS
- Testing for heteroscedasticity
- Remedial measures (weighted least squares estimation) (Wooldridge, ch. 8; Gujarati, ch. 11)

Multicollinearity Problem

- Nature and Consequences of Multicollinearity
- Detecting Multicollinearity (Wooldridge, ch. 3 (3.4); Gujarati, ch. 10)

Autocorrelation Problem

- Nature and Consequences of Autocorrelation, Serial Correlation
- Testing for Autocorrelation
- Remedial measures

(Wooldridge, ch. 12 (12.1-12.3); Gujarati, ch. 12)

Instrumental Variables Estimation (if time allows)

- Motivation
- The instrumental variables (IV) method (Wooldridge, ch.15;)

========== FINAL EXAM ==========

BACHELOR OF ECONOMICS
THAMMASAT UNIVERSITY

ACADEMIC CALENDAR & HOLIDAY
SEMESTER 1/2023

Semester 1/2023 (August 15 – December 4, 2023)	
the TU Office of the Registrar (TU REG) will process the registration (semester 1/2023) for all BE students who have completed the pre-registration via BE Portal.	July 17 – 20, 2023
Tuition Fee Payment Period (Via TU Greats App)	July 21 – August 11, 2023
Create Plan from Quota via TU Greats App (*ID.66)	August 1 - 9, 2023
Registration via TU Greats App (*ID.66)	August 10, 2023
Classes Begin	August 15, 2023
Add-drop period	August 15 – 28, 2023 *(from 9.00 AM of August 15 to 10.30 PM of August 28)*
Tuition Fee Payment Period (Via TU Greats App)	August 15 – 29, 2023 *(9 AM - 10.30 PM)*
Mid-term Examination Period	October 1 – 7, 2023
*H.M. King Bhumibol Adulyadej The Great Memorial Day**	*October 13, 2023*
*King Chulalongkorn's Day**	*October 23, 2023*
Withdrawal period with "W" on record	September 4 – October 22, 2023 *(from 9.00 AM of September 4 to 10.30 PM of October 22)*
Special Withdrawal with "w" on record	October 24 – November 20, 2023
Last day of class for Semester 1/2023	December 4, 2023
Final exam period	December 12 – 23, 2023
*H.M. King Bhumibol Adulyadej The Great's Birthday**	*December 5, 2023*
*Constitution Day**	*December 10, 2023*
*Substitution for Constitution Day**	*December 11, 2023*
Submitting Forms for Degree Conferral	August 15 – 28, 2023

Remark * Holiday, No classes during this period
Updated: July 24, 2023