ECON 3034 Econometrics II

National Tsing Hua University

Spring 2005

Instructor: Shih-Chang Lin

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Time and Location: Monday 1:00-3:00 pm and Thursday 1:00-2:00pm, HSS-A420

Office Hours: Tuesday 11:00-12:00 or by appointment

Course Webpage: Course materials will be available on the web through **Blackboard**.

Teaching Assistant: Peng-Yuan Sue

You are lucky to have Peng-Yuan Sue to be your TA.

Teaching Assistant Hours: Wendesday 1-2:00 pm

TA will hold the office hours and also be available for consultation on homework.

Course Description:

This course is the second part of the introduction to econometrics sequence. The first part of the sequence introduces the basic idea of regression. OLS will be a nice estimation method under some "classical" assumptions. Based on the knowledge of classical linear regression model, we would first explore the issue of violating those "classical" assumptions. Then we will concentrate on particular topics in econometrics such as discrete choice, simultaneous equations, panel data and time series models. A number of estimation strategies will be formally introduced. You are expected to have a firm grasp of the types of empirical research designs that can lead to convincing analysis and be comfortable working with actual data sets.

The primary focus of this course is on estimation theory (with extension to testing). Although the aim will remain on the underlying theory, students will be given several opportunities to gain "hand on" experience with real data set through homework assignments. I would encourage students to make use of my office hours (or TA's office hours) during the semester and not wait until the day before the exam. If you are having difficulty with concepts early on, then it is likely that your difficulties will snowball and that there will be insufficient time to deal with your puzzles close to the exams. So please make use of my office hours to sort out difficulties as they arise.

Prerequisites:

ECON 3033 or equivalent undergraduate level Econometrics

Required Textbook:

Basically, I will hand out weekly lecture notes which are the summary of textbooks.

- Gujarati, D. N., 2003, *Basic Econometrics*, McGraw-Hill.

Of course, there are lots of textbooks related to this course. If you have enough time, it would be also beneficial to check out some of the following references.

References:

Note that you don't need to buy the following books. The book list is just for your reference.

- Wooldridge, J. M., 2003, *Introductory Econometrics: A modern approach*, South-Western.

  It is a very popular undergraduate level textbook adopted in US. This book gives a huge amount of empirical examples and illustrates econometric concepts intuitively.

- Maddala, G. S., 2001, *Introduction to Econometrics*, 3rd edition, Wiley.

  This book is well written and in general is deeper than our textbook. You could also find some fancy topics in Maddala's book such as bootstrap, Jackknife and GMM.

- Kennedy, P. A., 1998, *A guide to Econometrics*, 4th edition, MIT Press.

  This book tries to verbally explain difficult econometric ideas and avoids heavy math.

- Pindyck, R. S. and L. R. Rubinfeld, 1998, *Econometric Models and Economic Forcasts*, McGraw-Hill.

  Ths is my econometric textbook when I was a junior. It is quite easy to read.

- Ramanathan R., 2002, *Introductory Econometrics with Applications*, 5th edition, South-Western.

  This book provides a number of practical applications. It is also self-contained. In Chapter 14, the author demonstrates the various steps involved in carrying out an empirical research project.

- Johnston and DiNardo, 1997*, Econometric Methods,* 4th edition, McGraw-Hill.

  If you are sort of familiar with matrix algebra, it is a nice book to build up the foundation of econometrics. It also serves the bridge to compensate the gap between undergraduate and graduate level econometrics.

Software: You are welcome to use any econometric packages such as *TSP, Stata, Eview, or Limdep.*

Grading: Couples of problem sets will be passed out during the semester. Although there are benefits to be obtained from working in groups I would advise against students free-riding off other students. There will be two midterms and a final. Note that overdue assignment will **NOT** be accepted unless accompanied by a medical certificate. The same is true for the exams. Your final grade will base on the following table. Note that **NO** make-up exam will be offered.

Assignments	20%
Midterm I	25%
Midterm II	25%
Final	30%.

Course Organization: 17 weeks / lectures [Tentative!!]

1. **Organization and Review of CLR Model**
   Feb. 21st
   Feb. 24th

2. **Heteroskedasticity**
   Mar. 3rd – Definition and Detection

3. **Heteroskedasticity**
   Mar. 7th – Detection & Remedy
   Mar. 10th – Remedy

4. **Autocorrelation**
   Mar. 14th – Definition & Detection
   Mar. 17th – Detection

5. **Model Specification**
   Mar. 21st – Omitted Variables & Irrelavent Variables
   Mar. 24th – Model Selection Criterion

6. **Mar. 28th: Midterm Exam I [In class]**
   Mar. 31st: Return exam papers

7. **Numerical Optimization**
   Apr. 7th – Newton's Method

8. **Discrete Choice Model I**
   Apr. 11th – Binary Choice Model
   Apr. 14th – Linear Probability Model

9. **Discrete Choice Model II**
   Apr. 18th – Probit & Logit
   Apr. 21st – Interpretation & Implementation

10. **Sample Selection Model**
    Apr. 25th – Tobit Model
    Apr. 28th – Interpretation & Implementation

11. **May 2nd: Midterm Exam II [In class]**
    May 5th: Return exam papers

12. **Endogeneity Problem I**
    May 9th – Definition & Sources of Endogeneity
    May 12th – Consequence of Endogeneity

13. **Endogeneity Problem II**
    May 16th – Instrumental Variables
    May 19th – Application & Interpretation of IV

14. **Simultaneous Equation Model I**
    May 23th – Definition & Identification
    May 26th – Application of Identification

15. **Simultaneous Equation Model II**
    May 30th – Indirect Least Squares
    Jun. 2nd – Two Stage Least Squares

16. **Times Series**
    Jun. 6th: Basic Concepts & Unit Roots
    Jun. 9th: Cointegration

17. **Jun 13th: Final Exam [In class]**