ECONOMICS 507: ECONOMETRICS I

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Rutgers University, Newark
Spring 2015

Description and Learning Goals

Econometrics, literally "economic measurement," is a branch of economics that attempts to quantify theoretical relationships. This course presents topics in econometrics including a classical linear regression model and some advance topics. This course will have both a theoretical and an applied econometrics components. There will be a focus on using econometrics software in estimating econometrics models learned during the semester and interpreting the results. Students will also learn to read journal articles applying various econometric models and presenting the findings.

Pre-requisites

Students should have a basic knowledge of statistical methods and some Calculus (640:119 or 640:135). An undergraduate training in introductory econometrics is recommended

Grading

Grading will be based on exams, term project/homework as follows:

Midterm Exam	30%
Final Exam	35%
Homework Assignments (Tentatively 2 -3) (Including empirical project)	25%
In Class Presentation of Journal Articles on topics covered	10%

Exams

Midterm (Tentatively)	(To be announced later)
Final	(To be announced later)

Teaching method

The course consists of weekly lectures. During the semester some lecture time will be devoted to demonstrating the use of the econometrics software. Blackboard will be the website for the class.

Required Text

1. Wooldridge, Jeffrey M., *Introductory Econometrics: A Modern Approach*, 5th Edition, South-Western College Publishing, 2009

2. Pindyck, Robert S. and Daniel I. Rubinfeld, *Econometric Models and Economic Forecasts*, Irwin McGraw-Hill, Inc., 4rth ed.

Suggested or Supplementary Texts

1. Greene, William H., Econometric Analysis, 7th edition, Prentice Hall.
2. Wooldridge, Jeffrey M., Analysis of Cross Section and Panel Data, MIT Press.
3. Johnston and DiNardo, "Econometric Methods," Fourth Edition. McGrawHill.
4. Mills, Terence C., *Time series Techniques for Economists*, Cambridge University Press, 1990.

Statistics

The required textbooks cover statistics: Wooldridge: Appendices A-C; Pindyck and Robinfeld: Ch 2

Wackerly Dennis D., Mendenhall III W., and Scheaffer R.L., *Mathematical Statistics with Applications*, 6th Edition, Duxbury Advanced Series, 2002.

Econometrics Software

STATA. Any alternative software capable of estimating multiple regression and some advance models will be fine.

Course Outline

1. Review of the Classical Linear Regression Model with respect to Gauss Markov Theorem including functional form and dummy variable
   Wooldridge Chs: 1 – 7
   Pindyck and Rubinfeld: Chs 1 - 5

2. Matrix Review and the Classical Regression Model in Matrix Form (**Optional)**
   Wooldridge: Appendix D & E
   Pindyck and Rubinfeld: Appendices Chs 1-6

3. Violations of the Classicl Linear Regression Assumptions
   Heterscedasticity; Serial Correlation; Measurement Error
   Wooldrdige Chs: 8 – 9 & 12
   Pindyck and Rubinfeld: Ch 6

4. Simultaneous Equation Estimation
   Identification; Instrumental Variable Estimation and Two Stage Least Squares (2SLS); Seemingly Related Regression (SURE); Three Stage Least squares (3SLS)
   Wooldridge: Chs 15 - 16
   Pindyck and Rubinfeld: Ch 7 and Ch 12

5. Maximum Likelihood Estimation (MLE)
   Wooldridge: Appendix C
   Pindyck and Rubinfeld: Appendix 2.2

6. Qualitative Choice Models
   Probit, Logit, and Tobit Model
   Wooldridge: Ch 17
   Pindyck and Rubinfeld: Ch 11

7. Time Series
   White noise,Trend, AR, MA, and ARMA process; Causality and Unit Root Tests; Forecasting
   Wooldridge: Chs 10 – 12 & parts of Ch 18
   Pindyck and Rubinfeld: Chs 8-9 & Chs 16-17
   (Additional Readings)

8. Panel Data Model
   Simple pooling; Fixed effect and random effect model; Panel Data Hypothesis test
   Wooldridge: Ch 13 & Ch 14

9. Nonparametric Econometrics (Local Estimation Methods).
   (Additional Readings)