ECONOMICS 220-507: ECONOMETRICS I

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Rutgers University, Newark
Lectures: Th: 5:30 – 8:20, IWP 508
Spring 2010
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Aim
Econometrics, literally “economic measurement,” is a branch of economics that attempts to quantify theoretical relationships. This course presents topics in econometrics including a review of the classical linear regression model and some advance topics. This course will have both a theoretical and an applied component and there will be a focus on using econometrics software in estimating econometrics models learned during the semester.

Pre-requisites
Students should have a basic knowledge of statistical methods and an undergraduate training in introductory econometrics along with some Calculus (640:119 or 640:135) as a minimum.

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

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Midterm Exam</td>
<td>30%</td>
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<tr>
<td>Final Exam</td>
<td>45%</td>
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<tr>
<td>Homework Assignments (Tentatively 5)</td>
<td>25%</td>
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Exams
Midterm (Tentatively) Mar 4
Final (Tentatively) During Finals Week

Teaching method
The course consists of three hour weekly lecture. 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

Suggested or Supplementary Texts
2. Wooldridge, Jeffrey M., Analysis of Cross Section and Panel Data, MIT Press.

**Statistics and Matrix Algebra Review**
The required textbooks cover statistics and matrix algebra review.
Wooldridge: Appendices A-D
Pindyck and Robinfeld: Ch 2

**Additional Statistics Textbook**

**Econometrics Software**
EViews (Student version will be fine) or STATA. Students may make use of these software in the Economics Lab (Hill Hall, Room 806). 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. The Classical Regression Model in Matrix Form
   Wooldridge: Appendix E
   Pindyck and Rubinfeld: Appendices Chs 1-6

3. Violations of the Classical Linear Regression Assumptions
   Heteroscedasticity; Serial Correlation; Multicollinearity
   Wooldridge Chs: 8 – 9
   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 – 11 & parts of Ch 18
   Pindyck and Rubinfeld: Chs 8-9 & Chs 16-17

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