Instructor:
Dr. Michael Sandfort

Email:
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Class Schedule:
Tuesdays from 6:00pm–8:45pm, September 10 – December 10

Overview:
This course is designed to enhance the student’s econometric toolset with standard techniques used in the empirical analysis of microdata. It is also designed to give the student an opportunity to use these new techniques in hands-on applications. The course begins with a brief review of the classical regression model and its underlying assumptions. Afterwards, we will move on to cover more advanced estimation techniques, including instrumental variables, regression systems, maximum likelihood, and the generalized method of moments. Along the way, we will cover econometric issues which frequently arise when working with microdata, e.g., panel data structure and limited dependent variables.

Expectations and Evaluation:
I expect the student to develop two different types of skills during the course: (1) understanding when use of a particular estimator is (in)appropriate, and (2) use of the estimator in practice. I use two tools to evaluate the student’s progress: homeworks and exams. Homeworks are an integral part of the course and are designed principally to test the student’s skills at use of the estimators discussed in class. Consequently, the homeworks will consist largely (although not exclusively) of estimation exercises involving work with data and econometric software (see below). While I encourage you to discuss the problem sets with one another and compare your methods in solving the individual exercises, the homework you submit to me should reflect your own struggle with the material and your own conclusions; you should be prepared to explain your solution to each exercise. Your solution to each empirical exercise should include (1) a concise summary of your results, and (2) a transcript of your R session.

There will be six homeworks (three graded, three ungraded), collectively accounting for 50% of your final grade. In addition, I will evaluate your progress with a midterm and a final examination, each accounting for 25% of your final grade. While the final exam will be cumulative, it will emphasize material from the second half of the course.

Textbooks and Readings:
The textbooks for this course are:

- **Econometric Anal. of Cross Section and Panel Data**, 2nd Ed., Jeffrey Wooldridge, 2010
  MIT Press (ISBN-10 = 0262232588)

  Cambridge Univ. Press (ISBN-10 = 0521743850)

I will also post some supplementary reading materials to Blackboard.

Questions:
Please don’t hesitate to ask questions during class or during class breaks. Please also feel free to email me with questions. If there’s sufficient demand, I’m happy to have periodic office hours at a mutually convenient time.
Computing Requirement:
The homeworks are an integral part of the course; each will have several exercises which require you to apply the tools you have learned in class. I will use the open source statistical package R in class both to illustrate concepts and demonstrate estimation. I expect you to develop a familiarity with R as part of your work in this course. The package can be downloaded from CRAN (http://lib.stat.cmu.edu/R/CRAN/).

University Ethics Statement:
The strength of Johns Hopkins University depends on academic and personal integrity. In this course, you must be honest and truthful. Ethical violations include cheating on exams, plagiarism, re-use of assignments, improper use of the Internet and electronic devices, unauthorized collaboration, alteration of graded assignments, forgery and falsification, lying, facilitating academic dishonesty and unfair competition. Report any violations you witness to the instructor. You may consult the associate dean of students and/or the chairman of the Ethics Board beforehand.

Course Outline and Reading Schedule:
Sep 10: Topics: Introduction and Review of Classical Regression
Readings: Freedman[1,2]; Wooldridge[1,2]
Assignments: Homework #1 Out

Sep 17: Topics: Matrix Algebra and Multiple Regression
Readings: Freedman[3,4]; Wooldridge[4]
Assignments: Homework #2 Out

Sep 24: Topics: Asymptotics and Hypothesis Testing
Readings: Freedman[5.6-5.7]; Wooldridge[4]

Oct 01: Topics: Regression Systems, GLS and FGLS
Readings: Freedman[5.3-5.5]; Wooldridge[7]
Assignments: Homework #2 Due, Homework #3 Out

Oct 08: Topics: Linear Unobserved Effects Panel Data Models (POLS and FE)
Readings: Wooldridge[10]

Oct 15: Topics: Linear Unobserved Effects Panel Data Models (RE and FD)
Readings: Wooldridge[10]

Oct 22: Midterm Exam

Oct 29: Topics: Instrumental Variables and 2SLS
Readings: Freedman[6]; Wooldridge[5]
Assignments: Homework #4 Out

Nov 05: Topics: Generalized Method of Moments
Readings: Wooldridge[8]
Assignments: Homework #4 Due, Homework #5 Out

Nov 12: Topics: Simultaneous Equations Models
Readings: Wooldridge[8]

Nov 19: Topics: Maximum Likelihood Estimation
Assignments: Homework #5 Due, Homework #6 Out

Nov 26: Topics: Data with Bivariate Responses (Logit and Probit)
Readings: Freedman[7.2-7.6]; Wooldridge[15]

Dec 03: Topics: Data with Multivariate and Ordered Responses
Readings: Wooldridge[16]

Dec 10: Final Exam