

PPHA 313: Advanced Statistics for Data Analysis II
Course Syllabus: Winter 2019

Instructor: Bruce D. Meyer (bdmeyer@uchicago.edu)

Time and Location: MW 9:30-10:50 (Section 1), 11:00-12:20 (Section 2), Keller Center 1002

Office Hours: Tu, W 2:00-3:00 (some weeks I will need to cancel one of the days, but not both)
Keller Center 2037

Description: This course is a mathematically based introduction to econometrics and is a continuation of the empirical methodology core sequence that is intended to follow PPHA 312. The course focuses on multivariate regression methods and their interpretation.

Teaching Assistants: Ken Chen cken@uchicago.edu; Darshan Sumant darshansumant@uchicago.edu; Daniel Tracht dtracht@uchicago.edu; Ruo Chen Yi ruochenyi@uchicago.edu; Derek Wu derekwu@uchicago.edu

Weekly TA Sessions: T 11:00-12:20 in Keller 0010 (Darshan), Th 11:00-12:20 in Keller 0010 (Ruo Chen), F 11:00-12:20 in Keller 0010 (Daniel), F 2:00-3:20 in Keller 0023 (Ken)

TA Office Hours: M 3:00-4:20 in Keller 2058 (Darshan), T 10:00-11:20 in Keller 2058 (Ken), Th 12:30-11:50 in Keller 2058 (Ruo Chen), F 12:30-1:50 in Keller 2058 (Daniel)

Stata Bar: T 12:30-2:00 in Keller 0007, W 4:00-6:00 in Keller 0007

R Bar: T 5:00-7:00 in Keller 1022, Th 12:30-2:30 in Keller 0021

Assignments and Grading: The final grade for the course will be a function of the midterm (30%), final (40%), six homework assignments (30%). The final will be cumulative.

Homework Assignments: There will be six homework assignments. You may work on the problems with others in the class, but each student must write up his/her answer set individually. You must also indicate at the top of your answer sheet who in the class you worked with. Write-ups that are materially similar between students will be regarded as cheating and receive zero credit. See the plagiarism policy at https://docs.google.com/document/d/1tO6Gq_9rNwBcHE5Ss3tT2I8lKeJoVYGqSsv0L1wKjxc/edit

Problem sets will be posted to the website as soon as they are available. Answer keys will be posted to the website shortly after the problem sets are due. Therefore, problem sets are due on the due date and **no late problem sets will be accepted.**

The midterm and the final will both be closed book exams. No cell phones, calculators, etc. will be allowed. **There will be no make-up exams.**

Midterm: Monday, February 11, in class

Final: Monday, March 18, 9:00-11:50

Readings: The test for the course is *Introductory Econometrics: A Modern Approach* (6th Ed.) by Jeffrey M. Wooldridge. Earlier editions are fine as is the 7th edition which is coming out in January, but I will indicate readings only for the 6th edition—you are responsible for cross-walking the chapters to a different edition.

Discussion board: Students should post questions about the material and clarifying questions about homework assignments on the Canvas course discussion board.

Prerequisites: This course is a continuation of PPHA312 or an alternative rigorous basic statistics course is required.

Course Calendar

The following calendar is meant as a rough guide. We will do our best to keep the schedule and homework dates unchanged. In terms of lecture material, this is the order of the material, but we expect some content to take longer than one lecture, so the dates may change. Additional readings will be posted online.

- Lecture 1. (Jan. 7) *Course Introduction, Causality, Randomized Controlled Trials*
Wooldridge Chapter 1
- Lecture 2. (Jan. 9) *Randomized Controlled Trials (cont.), Bivariate Linear Regression*
Cullen, Jacob and Levitt (2006), Wooldridge Chapter 2
- Lecture 3. (Jan. 14) *Bivariate Linear Regression: properties, testing*
Wooldridge Chapter 2
- Lecture 4. (Jan. 16) *Multivariate Linear Regression, omitted variable bias*
Wooldridge Chapter 3
Homework 1 Due by 5pm
- January 21 MLK Day NO CLASS
- Lecture 5. (Jan. 23) *Multivariate Regression, testing*
Wooldridge Chapter 4
- Lecture 6. (Jan. 28) *Asymptotics*
Wooldridge Chapter 5
Homework 2 Due by 5pm
- Lecture 7. (Feb. 4) *Scaling, Functional Forms, Residual Analysis*
Wooldridge Chapters 6.1, 6.2, 7
- Lecture 8. (Feb. 6) *Tools: Heteroskedasticity and Weighted Least Squares*
Wooldridge Chapters 8
Homework 3 Due by 5pm

MIDTERM February 11 (Monday), in class

- Lecture 9. (Feb. 13). *Binary Dependent Variables*
Wooldridge Chapter 7, 17.1
- Lecture 10. (Feb. 18) More on Testing, etc.: Power and Significance, Outliers, Non-nested tests, multiple hypothesis testing
Wooldridge Chapter 6.3, 9.1, Meyer, Viscusi and Durbin (1995)
- Lecture 11. (Feb. 20) *Problems: Missing Data, Measurement Error, Simultaneity*
Wooldridge Chapter 9.4, 9.5, 16.1, 16.2
Homework 4 Due by 5pm
- Lecture 12. (Feb. 25) *Solutions: Natural Experiments*
Wooldridge Chapter 13.1, 13.2; Meyer (1995)
- Lecture 13. (Feb. 27) *Solutions: Regression Discontinuity*
Schmieder, von Wachter and Bender (2012)—Skip Section II (pp. 705-711)
- Lecture 14. (Mar. 4) *Solutions: Instrumental Variables*
Wooldridge Chapter 15, Angrist and Evans (1998)
Homework 5 Due by 5pm
- Lecture 15. (Mar. 6) *Solutions: Panel Data Strategies*
Wooldridge Chapter 13
- Lecture 16. (Mar. 11) *Solutions: Panel Data Strategies (cont.)*
Wooldridge Chapter 13, 14.1
Homework 6 Due by 5pm
- Lecture 17. (Mar. 13) *Time Series Data; Unfinished topics*
Wooldridge Chapter 10
- Lecture 18. (Mar. 7 5pm) *Putting Everything Together and Doing Empirical Work*
Cullen, Jacob and Levitt (2006)

FINAL March 18 (Monday), 9:00-11:50