PPHA 313: Advanced Statistics for Data Analysis II
Course Syllabus: Winter 2023

Instructor: Bruce D. Meyer bdmeyer@uchicago.edu
Time and Location:
TTH 9:30-10:50 (Section 1) 11:00-12:20 (Section 2) Keller 0021
Office Hours: Tu 5-6 (5:15-6 on Jan 24, Feb 28), Weds 4-5 Keller 2037 or Midway Ice Rink

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. **This is a fast-paced course and each week's material requires an understanding of the previous' weeks content.** You will need to keep pace with weekly quizzes and problem sets that assess your understanding of material learned in the prior weeks.

I will be using a **flipped classroom model** with students expected to view recorded lectures ahead of time for discussion in class. I will ask students to submit questions ahead of time, and will typically prepare an example or problem for class. Short 15 minute weekly quizzes requiring short answers will be given on Tuesdays at the start of class.

Teaching Assistants:
Angela Wyse, Head TA awyse@uchicago.edu
Phoebe Collins, phoebecollins@uchicago.edu
Bettina Hammer, bhammer@uchicago.edu
Office Hours: Mo 6:30-8:30pm (virtual—link on Canvas), Weds 4:30-6:30pm (Keller 2058)

Weekly TA Sessions:
Friday 9:00-10:20 (Section 1) Keller 0021
Friday 10:30-11:50 (Section 2) Keller 0021

Core Tutoring Program: Harris offers 10 hours of free tutoring for students enrolled in core classes. Students can get assistance with understanding statistical concepts, reinforcing computational rules, and with coding in Stata or R. Any questions should be directed to HarrisStudentAffairs@uchicago.edu.

Attendance: The bulk of your learning will come from three sources: assigned readings, pre-recorded online lectures and slides, and in-class discussions of each lecture's material. You will be required to attend the live discussions of each lecture's material that will cover additional examples, allow ample opportunity to ask questions and discuss big-picture topics. Please attend only the section in which you are enrolled. We also encourage you to attend weekly discussion sessions led by the TAs, which will review content from that week's problem set.

Assignments and Grading: The final grade for the course will be a function of eight quizzes (you will count your top 7) (25%), eight homework assignments (40%), a final exam on Wednesday, March 8 (30%), and class participation (5%). In accordance with student requests, I will be using anonymous grading. Thus, homework assignments and quizzes should have your **student number** on them, not your name. **NOTE:** I will be grading on an adjusted Harris Core

curve, with a higher share of higher grades than the standard curve, since you are choosing an advanced course.

Homework Assignments: The nine homework assignments will be due on **Wednesday mornings** and will focus on the previous week's content. You are encouraged to form your own homework groups to share approaches (not answers), but each student must write up his/her answer set individually. You must also indicate at the top of your answer sheet the **student numbers** of those in the class you worked with. Write-ups that are materially similar between students or rely on answers from past years will be regarded as cheating and receive zero credit. If you have difficulty finding other students to work with, please send the TAs an email and we can help connect you with a group.

Problem sets are due on the due date and **late problem sets will not be accepted**. We will review the previous problem set in each week's TA session.

Quizzes: There will be eight timed in-class quizzes on Tuesdays. **These quizzes will focus on material covered in the previous week's assigned readings, lecture slides recorded video lectures, and remote or in-class discussion**, but will draw on earlier material as well. For example, the quiz on 1/10 will cover the recorded video lectures on the topics listed under Week 1. The quizzes will be in class and closed book, and cannot be discussed with anyone until after section 2 is over at 12:20pm.

Harris Integrity Policy for Problem Sets Involving Programming Code:
Academic dishonesty will not be tolerated. If you commit plagiarism, you may receive an F and be referred to the Area Disciplinary Committee. All work must be your own.

Do not:
• Show other students your code, or ask for another student's code
• Use prior year's answers for problems or online solutions you might find
• Copy large portions of code from online repositories (e.g., replication code)

Every submission begins with "This submission is my work alone and complies with the 313 integrity policy. Add your initials to indicate your agreement: __ "

How should you collaborate? You can clarify ambiguities in problem set questions, discuss conceptual aspects of problem sets, show output on screen (e.g. a graph or table), and show helpful documentation files.

Readings: The text for the course is *Introductory Econometrics: A Modern Approach* (7th Ed.) by Jeffrey M. Wooldridge. Earlier editions are fine, but I will indicate readings only for the 7th 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 Ed Discussion board, which is available as a tab on the course Canvas page.

Prerequisites: 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.

Jan. 3, 5   *Course Introduction, Causality, Randomized Controlled Trials*
Wooldridge Chapter 1

Randomized Control Trials (cont.), Bivariate Linear Regression
Cullen, Jacob and Levitt (2006), Wooldridge Chapter 2

Quiz 0 available on Canvas from 9am on 1/3 to 11:59pm on 1/4

Jan. 10, 12   *Bivariate Linear Regression: properties*
Wooldridge Chapter 2

Multivariate Linear Regression, omitted variable bias
Wooldridge Chapter 3

1/10: Quiz 1
1/11: Problem Set 1 Due by 10am

Jan. 17, 19   *Multivariate Regression, testing*
Wooldridge Chapter 4

Asymptotics
Wooldridge Chapter 5

1/17: Quiz 2
1/18: Problem Set 2 Due by 10am

Jan 24, 26   *Scaling, Functional Forms, Residual Analysis, Outliers*
Wooldridge Chapters 6.1, 6.2, 7, Meyer, Viscusi and Durbin (1995)

Power and Significance, Non-nested tests, multiple hypothesis testing
Wooldridge Chapter 6.3, 9.1,

1/24: Quiz 3
1/25: Problem Set 3 Due by 10am

Jan 31, Feb 2   *Tools: Heteroskedasticity and Weighted Least Squares*
Wooldridge Chapters 8

Problems: Missing Data, Measurement Error, Simultaneity
Wooldridge Chapter 9.4, 9.5, 16.1, 16.2

1/31: Quiz 4
2/1: Problem Set 4 Due by 10am

Feb 7, 9   *Binary Dependent Variables*
                Wooldridge Chapter 7, 17.1

                Optional: Discrete and Limited Dependent Variables
                Wooldridge Chapter 17, Train Chapters 3 and 7

                Solutions: Natural Experiments
                Wooldridge Chapter 13.1, 13.2; Meyer (1995)

                2/7: Quiz 5
                2/8: Problem Set 5 Due by 10am

Feb 14, 16   *Solutions: Regression Discontinuity*
                Schmieder, von Wachter and Bender (2012)—Skip Section II (pp. 705-711)

                Solutions: Instrumental Variables
                Wooldridge Chapter 15, Angrist and Evans (1998)

                2/14: Quiz 6
                2/15: Problem Set 6 Due by 10am

Feb 21, 23   *Solutions: Panel Data Strategies*
                Wooldridge Chapter 13

                Solutions: Panel Data Strategies (cont.)
                Wooldridge Chapter 13, 14.1

                2/21: Quiz 7
                2/22: Problem Set 7 Due by 10am

Feb 28, Mar 2   *Time Series Data; Unfinished topics*
                Wooldridge Chapter 10

                Putting Everything Together and Doing Empirical Work
                Cullen, Jacob and Levitt (2006)

                2/28: Quiz 8
                3/1: Problem Set 8 Due 10am

Finals week   **Final Exam Wednesday 3/8 at 9-11, Sky Suite Keller 4th Floor**

Other Policies

- We ask that students not eat or drink during class.
- Please display your name tent every class so that I can more easily call on you by name. If you would like to replace your Name Tent at any time, please find the template to print a new one here. You can pick up blank tent cards for printing at the Academic and Student Affairs Suite front desk (suite in the southeast corner of the Keller Center).

Resources available to students

- The University offers a comprehensive set of student support services, including student health services. And in response to the COVID-19 pandemic and associated disruptions, the University has provided links for students via its "Learning Remotely" website. Counseling services are available; details are posted at https://wellness.uchicago.edu/mental-health/. ***Students needing urgent mental health care can speak with clinicians over the phone 24/7 by calling the Therapist-on-Call at 773.702.3625.***
- Harris School itself provides both academic support services for students, described (and links provided) on this page of the Harris website.

Harris School and University of Chicago Policies

For general information see University's Student Manual and the Harris School's own student policies and regulations
Academic Integrity

All University of Chicago students are expected to uphold the highest standards of academic Integrity and honesty. Among other things, this means that students shall not represent another's work as their own, use un-allowed materials during exams, or otherwise gain unfair academic advantage.

- The University's policies regarding academic integrity and dishonesty are described here. It is worth explicitly stating the University's approach here: "It is contrary to justice, academic integrity, and to the spirit of intellectual inquiry to submit another's statements or ideas as one's own work. To do so is plagiarism or cheating, offenses punishable under the University's disciplinary system. Because these offenses undercut the distinctive moral and intellectual character of the University, we take them very seriously."
- The Harris School's student policies are available on the policies page of our website.
  - The *Academic Honesty and Plagiarism* section expresses the main principles.
  - Detailed guidelines for more specialized student work (e.g., problem sets including computer code) are offered in the sub-section titled *Harris Integrity Policy for Problem Sets Involving Code.*
- Harris's specific procedures for handling suspected violations of these policies are available in the section *Harris Procedures for Allegations of Plagiarism, Cheating, and Academic Dishonesty.*
  - All students suspected of academic dishonesty will be reported to the Harris Dean of Students for investigation and adjudication. The disciplinary process can result in sanctions up to and including suspension or expulsion from the University.

Disability Accommodations

Student Disability Services (SDS) welcomes students to self-identify as an individual with a disability. SDS staff will engage with you in an interactive process to identify necessary services and accommodations to ensure equitable access to University programs and services.
If you self-identify as an individual with a disability or have access needs that are not obvious or invisible, and you are interested in requesting academic accommodations (e.g. extended time for test taking) contact Student Disability Services to initiate the accommodation request process as soon as possible. You also must submit current disability documentation that meets SDS guidelines to establish eligibility. You can find the necessary forms and instructions for accommodations related to learning disabilities here and accommodations related to physical disabilities here.

Please note that the process for requesting accommodations generally takes several weeks, but Student Disability Services can usually provide provisional accommodations in the interim.
Please contact disabilities@uchicago.edu with the documentation you have.
If SDS approves accommodations, a determination letter will be shared with the Harris Disability Liaison (Marley Mandelaro) and the Dean of Students. The liaison will then work with the student to implement your approved accommodations.

For students who have extended time as an approved accommodation, Marley Mandelaro, Harris Disability Liaison, will work with you and your instructors to arrange for your testing times and locations. For courses taken outside of Harris, the home department almost always arranges for the implementation of your accommodations, but Marley can also help you navigate that if you need.

Diversity and Inclusion

The Harris School welcomes, values, and respects students, faculty, and staff from a wide range of backgrounds and experiences, and we believe that rigorous inquiry and effective public policy problem-solving requires the expression and understanding of diverse viewpoints, experiences, and traditions. The University and the Harris School have developed distinct but overlapping principles and guidelines to insure that we remain a place where difficult issues are discussed with kindness and respect for all.

- The University's policies are available here. Specifically, the University identifies the freedom of expression as being "vital to our shared goal of the pursuit of knowledge, as is the right of all members of the community to explore new ideas and learn from one another. To preserve an environment of spirited and open debate, we should all have the opportunity to contribute to intellectual exchanges and participate fully in the life of the University."
The Harris School's commitments to lively, principled, and respectful engagement are available here: "The Harris School of Public Policy welcomes and respects students, faculty, and staff from a wide range of backgrounds, experiences, and perspectives as part of our commitment to building an inclusive community. *Fostering an environment that encourages rigorous inquiry and effective public policy problem-solving requires the involvement and understanding of diverse viewpoints, experiences, and traditions*. As a

leading public policy school, Harris holds diversity as a core value. That includes not only diversity of opinion, but diversity along a broad spectrum of factors, including race, ethnicity, national origin, gender identity, sexual orientation, ability status, religion, socio-economic background, and social or political belief. Recognizing the value of diversity and inclusion is essential to combating discrimination, addressing disparities, and cultivating ethical and clear-eyed policy leadership."

Video and Audio Recordings

By attending course sessions, students acknowledge that:

    i. They will not: (i) record, share, or disseminate University of Chicago course sessions, videos, transcripts, audio, or chats; (ii) retain such materials after the end of the course; or (iii) use such materials for any purpose other than in connection with participation in the course.

    ii. They will not share links to University of Chicago course sessions with any persons not authorized to be in the course session. Sharing course materials with persons authorized to be in the relevant course is permitted. Syllabi, handouts, slides, and other documents may be shared at the discretion of the instructor.

    iii. Course recordings, content, and materials may be covered by copyrights held by the University, the instructor, or third parties. Any unauthorized use of such recordings or course materials may violate such copyrights.

    iv. Any violation of this policy will be referred to the Dean of Students.