PPHA 313: Advanced Statistics for Data Analysis II
Course Syllabus: Winter 2025

Instructor: Bruce D. Meyer bdmeyer@uchicago.edu
Office Hours: Weds 3-4:30 (Tues instead on Jan. 14 and Feb. 4) in Keller 2037. Additional hours on the Midway Ice Rink

Class Time and Location:
MW 9:00-10:20 (Section 1) 10:30-11:50 (Section 2) Keller 0021

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 the material and problem sets that assess your understanding of material learned in the prior weeks.

Teaching Assistants and Office Hours:
Brian Curran (Head TA) bcurran@uchicago.edu Tues 3-4:30 in Keller 2050
Xinyi (Helen) Chen chen61@uchicago.edu Thurs 3:30-5 in Keller 2003
Gabriella (Gabby) Rocco grocco@uchicago.edu Mon 3-4:30 in Keller 2003
Ben Zhang bzhang369@uchicago.edu Mon 11:30-1 in Keller 2003

Weekly Discussion Sections:
Friday 9:00-10:20 (Section 1) Keller 1002
Friday 3-4:20 (Section 2) Keller 1002

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, lectures and posted slides, and in-class discussions. You will be required to attend the lectures. We will adhere to the Harris absence policy. 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 and other topics.

Assignments and Grading: The final grade for the course will be a function of eight homework assignments (15%), a midterm exam on Wednesday February 5 (35%), and a final exam on Tuesday, March 11 (45%), and class participation (5%). In accordance with student requests, I will be using anonymous grading. Thus, homework assignments and exams should have your **student number** on them, not your name. **NOTE:** I will be grading on an adjusted Harris Core curve, with a somewhat higher share of higher grades than the standard curve, since you are choosing an advanced course.

Homework Assignments: The eight homework assignments will be due on Canvas **Wednesday mornings** and will focus on the previous week's content. You are encouraged to form your own homework groups to share approaches, but each student must write up his/her answer set individually. Problem sets are due on the due date and **late problem sets will not be accepted**.

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 Canvas 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. 6, 8   *Course Introduction, Causality, Randomized Controlled Trials*
Wooldridge Chapter 1, Cullen, Jacob and Levitt (2006)

Bivariate Linear Regression
Wooldridge Chapter 2

Jan. 13, 15   *Multivariate Linear Regression, omitted variable bias*
Wooldridge Chapter 3

Testing
Wooldridge Chapter 4

1/15: Problem Set 1 Due on Canvas by 8:45 am

Jan. 22, 24   *Asymptotics*
Wooldridge Chapter 5

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

1/22: Problem Set 2 Due on Canvas by 8:45 am

Jan 27, 29   *Power and Significance, Non-nested tests, multiple hypothesis testing*
Wooldridge Chapter 6.3, 9.1

Tools: Heteroskedasticity and Weighted Least Squares
Wooldridge Chapters 8

1/29: Problem Set 3 Due on Canvas by 8:45 am

Feb 3   *Problems: Missing Data, Measurement Error*
               Wooldridge Chapter 9.4, 9.5

2/5: Problem Set 4 Due on Canvas by 8:45 am

MIDTERM EXAM Wednesday, February 5 in Class

Feb 10, 12   *Binary Dependent Variables*
               Wooldridge Chapter 7, 17.1

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

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

2/12: Problem Set 5 Due on Canvas by 8:45 am

Feb 17, 19   *Solutions: Regression Discontinuity*
               Schmieder, von Wachter and Bender (2012)—Skip Section II (pp. 705-711)

               Solutions: Instrumental Variables, Simultaneity
               Wooldridge Chapter 15, 16.1-3, Angrist and Evans (1998)

2/19: Problem Set 6 Due on Canvas by 8:45 am

Feb 24, 26   *Solutions: Panel Data Strategies*
               Wooldridge Chapter 13

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

2/26: Problem Set 7 Due on Canvas by 8:45 am

Mar 3, Mar 5   *Brief Introduction to Time Series Analysis*
               Wooldridge Chapters 10-11, 18.3

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

3/5: Problem Set 8 Due on Canvas by 8:45 am

FINAL EXAM Tuesday 3/11 at 1-3, Keller 0021 (Section 1) Keller 0023 (Section 2)

Other Policies
- No eating or drinking during class.
- Please display your name tent every class so that I can call on you by name.

Electronics
- Harris has instituted an electronics policy. There is now considerable evidence (see, for example, here, here, here, and here) that the use of electronics in classrooms has adverse impacts on learning. The policy reads: "*Harris core classes all forbid the use of screens in the classroom, with exceptions for SDS accommodations and for hand-written note-taking on tablets laid flat on students' desks.*"

Resources available to students
- The University offers a comprehensive set of student support services, including student health services. 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

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.

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."