THE UNIVERSITY OF CHICAGO
HARRIS SCHOOL
OF PUBLIC POLICY
Social Impact, Down to a Science

PPHA 34600: Program Evaluation
SYLLABUS
2025

Instructor: Prof. Fiona Burlig
Email: burlig@uchicago.edu
Office Hours: Thursday, 3:30pm – 5pm, Keller 2069

All-star TA team:

- *Head TAs:* Nathan Ausubel (nasubel@uchicago.edu) and Daisy Lu (daisylu@uchicago.edu)

Course logistics:

- Course website: This course uses Canvas for all materials.
- In-person lectures: Please be on time; we will start promptly. If you are feeling unwell, please do not attend. Slides will be posted to Canvas the night before class. There is no need to email us if you cannot attend class. See below for more details on the attendance policy.
- Office hours: We will hold in-person office hours, time above. We recommend that you prioritize bringing your questions to TA sessions and/or posting them to Ed Discussion over office hours, so that your classmates can also benefit from them. If you are interested in joining for office hours, please sign up for a 10 minute slot (found here). You may sign up alone, or in a group of up to 5. Please be respectful of your classmates when signing up for office hours. Any office hour sign-ups more than 2 weeks in advance without my prior permission will be deleted.
- TA sessions and TA office hours: TAs will hold TA sessions and office hours each week. The first half of each assigned timeslot will be used for TA sessions, and the second half will be used for office hours. TA sessions are not mandatory, but will be extremely helpful. We will not have time to cover coding in class; instead, this will take place through the TA sessions and office hours. We strongly encourage you to attend. You should attend the TA session for which you are registered.
- Quizzes: We will post not-for-credit comprehension check quizzes on the course's Canvas website. These are not required and will not count towards your grade, but I encourage you to complete them to check your understanding of the material.
- Pre-recorded lectures: After covering material in class, we will post accompanying lecture recordings to the course's Canvas website. These were recorded during the height of the COVID-19 pandemic, and no longer perfectly map to the course material. These videos are intended for your review, rather than as a substitute for in-person class time.

Course description: The goal of this course is to introduce students to program evaluation, provide an overview of current issues and methods for estimating treatment impacts, and prepare students to be effective consumers of empirical evaluations of real-world policies.

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A note on course sections: This course is divided into three sections. PPHA 34600-01 (T-Th 9:30-10:50, Keller 1022) will have an energy and environment focus. PPHA 34600-02 (T-Th 11:00-12:20, Keller 1022) and PPHA 34600-03 (T-Th 2:00-3:20, Keller 1022) will have an international development focus. The three sections will share TAs, problem sets, final exams, due dates, the majority of the course material, and the curve, but we will read different papers (see below). Note that if you are taking this course to fulfill a certificate requirement in international policy and development or in energy and environmental policy, you must register for the section that corresponds with your certificate. You should attend the section you are officially registered for.

Prerequisites: PPHA 31002 and PPHA 31102 or equivalent coursework in statistics and economic theory. Students lacking these prerequisites should seek permission from the instructor.

Requirements and grading: Grades will be based on two problem sets, an in-class midterm, an in-class final exam, and attendance. Problem sets will count for 12.5% each, the midterm will count for 30%, the final exam will count for 40%, and attendance will count for 5%. The course is graded according to the standard core Harris curve, such that approximately 12.5% of students will receive an A, 25% will receive an A-, 25% will receive a B+, 25% will receive a B, and 12.5% will receive a B- and below. You will receive an F in this class if you receive less than 50% of the total points available.

Problem sets: Problem sets must be typed and submitted electronically. Both assignments will receive equal weight. You may work in groups of up to three on your problem sets, ask the course TAs, get help from Harris' R consultants, and use generative AI tools (see below), but you must turn in your own problem set, with answers written in your own words. You may share code with other members of your group, but you may not share written answers with other students (including members of your own group). Your group may include students from any section of PPHA 34600 that I am teaching. All coding in problem sets must be done in R. Due dates are as follows:

- PS1: Tuesday of Week 3 (April 8, 2025) at 9PM Chicago time
- PS2: Tuesday of Week 8 (May 13, 2025) at 9PM Chicago time

Late problem set tokens: Each student will receive one late problem set "token" which allows them to turn in a problem set up to 48 hours after the deadline without penalty. This token is no questions asked and will be automatically applied to the first late problem set submission for each student. After this token has been used, any late problem set will receive no credit. Any additional extension requests must go through the Dean of Students office.

Re-grade policy: If you think that there is an error in the grading of your work, you must submit a typed written statement of the details of the problem in question to a TA attached to the assignment in question. The TAs will review both your reasoning and the problem and respond within one week. We reserve the right to re-grade the assignment in its entirety. If you are requesting a re-grade based on other students' grades, you must submit your own problem set and the other student's

problem set with your request in order to receive a re-grade. Regrades must be submitted within a week of problem sets being returned.

Exams: There will be two in-class exams. The midterm will take place on Thursday of week 5 (April 24, 2025), and the final will take place on Thursday of week 9 (May 22, 2025). Both exams will be closed-book and closed-note. You may not consult any materials or any other students during either exam. If you are absent during either exam, you will receive a zero unless your absence is explicitly cleared in writing by the Dean of Students' office.

Attendance policy: You are expected to attend lecture in person. We will take attendance using a sign-in sheet which will be circulated at the beginning of class. Beginning with week 3, each lecture will count for $1/14^{th}$ of your attendance grade. Do not email us if you are unable to attend class. The only exception to this policy is for absences that are explicitly cleared in writing through the Dean of Students' office. TA session attendance is not mandatory, and we will not take attendance during TA sessions, but we strongly recommend that you attend.

Readings: Materials for this course consist of two main items: (1) our lectures, and the accompanying slides, which will be focused on theory, and (2) a variety of papers that will be available from the course website, which will provide examples of each method. Instruction on and practice with coding will take place in TA sessions. See the schedule and reading list below for topics and associated readings.

Additional policies:
Ed Discussion: The course will have an Ed Discussion site, accessed through Canvas, and maintained by the TAs. If you have content-related questions, please post them on Ed Discussion. Note that neither we nor the TAs will respond to Ed Discussion questions submitted within 24 hours of a problem set deadline or the exams.

Email: Please use Ed Discussion over email for questions related to course content. If your non-content-related email cannot be answered in a paragraph or less, we will ask you to come to office hours or make an appointment so that we can discuss it in person. We will do my best to respond to emails within 48 hours (M-F). If you have not heard from me within 48 hours, please re-send your email. To greatly increase the likelihood that we (or the TAs) see your email, please be sure to include [PPHA 34600] in the subject line. There is no guarantee that we or the TAs respond to emails and/or Ed Discussion posts sent within 24 hours of a problem set deadline or the exams.

Statistical software: Data work for this class, including problem sets and/or the final exam, will be done in R. We recommend that you use RStudio in conjunction with the tidyverse.

Generative AI: The use of AI tools such as ChatGPT or Dall-E2 is permitted on the problem sets only. You are not required to use AI tools, but if you choose to use them for any part of the assignments, you must use proper citation. While you may use AI tools to assist you in working on the problem sets, your final written answers must be in your own words (i.e., may not be copied-and-pasted from an AI tool). Failure to properly cite AI tools, or directly using text from AI tools, is considered a violation of the Academic honesty policy (see below). If you are unclear whether something is an AI tool, please check with the instructional team. You may not use AI tools on the exams.

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Academic honesty: The Harris School has a formal policy on academic honesty that you are expected to adhere to. Examples of academic dishonesty include (but are not limited to) turning in someone else's work as your own, turning in the same written text as someone else on a problem set/exam, copying solutions to past years' problem sets, receiving any unapproved assistance on exams, and posing as another student / having another student pose for you for the purposes of the attendance policy. This course has a *zero-tolerance* policy for academic dishonesty. Any student found in violation of this academic honesty policy will receive an automatic F in the class. We will also refer all cases of cheating to the office of the Dean of Students. They may in turn impose further penalties as per the Harris School Disciplinary Procedures, including probation and expulsion. If you have any questions regarding what would or would not be considered academic dishonesty in this course, please do not hesitate to ask.

ADA accommodations: Any student who believes they may need assistance should inform the Office of Student Disability Services by the end of the first week of class. Once you have received an accommodation letter, it should be presented to the course instructor immediately. For more information, see https://disabilities.uchicago.edu/**.**

List of lecture topics and deadlines (subject to adjustments):

Week 1-1: Why program evaluation?
Week 1-2: Treatment parameters and regression
Week 2-1: Randomized controlled trials I
Week 2-2: Randomized controlled trials II
Week 3-1: Randomized controlled trials III

PS1: DUE 3-1 (April 8, 2025)

Week 3-2: Selection on observables
Week 4-1: Instrumental variables I
Week 4-2: Instrumental variables II
Week 5-1: Instrumental variables III

Week 5-2: IN-CLASS MIDTERM EXAM (April 24, 2025)

Week 6-1: Panel data I
Week 6-2: Panel data II
Week 7-1: Panel data III
Week 7-2: Regression discontinuity I
Week 8-1: Regression discontinuity II

PS 2: DUE 8-1 (May 13, 2025)

Week 8-2: Big data and machine learning
Week 9-1: Policy lab

Week 9-2: IN-CLASS FINAL EXAM (May 22, 2025)

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Reading list: Readings will be made available through the course website. Please only read the papers that correspond to your section. We are not asking you to read much, so all readings are mandatory unless otherwise noted. Please read the version from the course website to make sure we are all on the same page. If you are looking for extra material, *Mostly Harmless Econometrics* and *Causal Inference:* The Mixtape (available online for free) may be useful references, but are not required beyond where they are specified on the reading list below.

Why program evaluation?

- No readings for the first class.

Treatment parameters and regression

- **ALL SECTIONS:** Cunningham, Scott. 2021. *Causal Inference:* The Mixtape, Yale University Press: New Haven, CT: Chapter 4 "Potential outcomes causal model". Available online.

Randomized controlled trials I

- **EEE:** Duflo, Esther, Michael Greenstone, Rohini Pande, and Nicholas Ryan. 2013. "Truth-telling by third-party auditors and the response of polluting firms: Experimental evidence from India," *The Quarterly Journal of Economics*, 128(4): 1499--1545.
- **DEV:** Hussam, Reshmaan, Erin M. Kelley, Gregory Lane, and Fatima Zahra. 2022. "The psychosocial value of employment: Evidence from a refugee camp," *American Economic Review*, 112(11): 3694—3724.

Randomized controlled trials II

- **ALL SECTIONS:** Fowlie, Meredith, Catherine Wolfram, C. Anna Spurlock, Annika Todd, Patrick Baylis, and Peter Cappers. 2020. "Default Effects and Follow-on Behavior: Evidence from an Electricity Pricing Program," *NBER Working Paper w23553.*

Randomized controlled trials III

- **ALL SECTIONS:** Bergquist, Lauren, Marshall Burke, and Edward Miguel. 2019. "Sell low and buy high: Arbitrage and local price effects in Kenyan markets," *The Quarterly Journal of Economics,* 134(2): 785--842.
- *Optional reading:* Baird, Sarah, J. Aislinn Bohren, Craig McIntosh, and Berk Ozler. 2014. "Designing experiments to measure spillover effects," *IIEP working paper.*

Selection on observables

- **ALL SECTIONS:** Davis, Lucas W., Alan Fuchs, and Paul Gertler. 2014. "Cash for coolers: Evaluating a large-sale appliance replacement program in Mexico," *American Economic Journal: Economic Policy,* 6(4): 207--238.

Instrumental variables I

- **EEE:** Schlenker, Wolfram and W. Reed Walker. 2016. "Airports, air pollution, and contemporaneous health," *The Review of Economic Studies*, 82(3): 768--809.
- **DEV:** Miguel, Edward, Shanker Satyanath, and Ernest Sergenti. 2014. "Economic shocks and civil conflict: An instrumental variables approach," *Journal of Political Economy*, 112 (4): 725--753.

Instrumental variables II

- **ALL SECTIONS:** Maccini, Sharon and Dean Yang. 2009. "Under the weather: Health, schooling, and economic consequences of early-life rainfall," *American Economic Review,* 99(3): 1006--1026.

Instrumental variables III

- No new reading. Review Fowlie, Wolfram et al.

Panel data I

- **EEE:** Currie, Janet, Lucas Davis, Michael Greenstone, and W. Reed Walker. 2015. "Environmental health risks and housing values: Evidence from 1600 toxic plant openings and closings," *American Economic Review*, 105(2): 678--709.
- **DEV:** Jensen, Robert. 2007. "The digital provide: Information (technology), market performance, and welfare in the South Indian fisheries sector," *The Quarterly Journal of Economics,* 122(3): 879--924.

Panel data II

- **ALL SECTIONS:** Hsiang, Solomon M. and Amir S. Jina. 2014. "The causal effect of environmental catastrophe on long-run economic growth: Evidence from 6,700 cyclones," NBER Working Paper w20352.
- *Optional reading:* Goodman-Bacon, Andrew. 2018. "Difference-in-differences with variation in treatment timing," *Working paper.*

Panel data III

- **EEE:** Keiser, David A. and Joseph S. Shapiro. 2018. "Consequences of the Clean Water Act and the demand for water quality," *The Quarterly Journal of Economics*, 134(1): 349--396.
- **DEV:** Muralidharan, Karthik and Nishith Prakash. 2017. "Cycling to school: Increasing secondary school enrollment for girls in India," *American Economic Journal: Applied Economics*, 9 (3): 321--350.

Regression discontinuity I

- **EEE:** Ito, Koichiro. 2015. "Asymmetric incentives in subsidies: Evidence from a large-scale electricity rebate program," *American Economic Journal: Economic Policy*, 7(3): 209--237.
- **DEV:** Dell, Melissa and Paulo Querubin. 2018. "Nation building through foreign intervention: Evidence from discontinuities in military strategies," *The Quarterly Journal of Economics*, 133 (2): 701--764

Regression discontinuity II

- **ALL SECTIONS:** Chen, Yuyu, Avraham Ebenstein, Michael Greenstone, and Hongbin Li. 2013. "Evidence on the impact of sustained exposure to air pollution on life expectancy from China's Huai River Policy," *Proceedings of the National Academy of Sciences*, 110(32): 12936--12941.
- *Optional reading:* Ebenstein, Avraham, Maoyong Fan, Michael Greenstone, Guojun He, and Maigeng Zhou. 2017. "New evidence on the impact of sustained exposure to air pollution on life expectancy from China's Huai River Policy," *Proceedings of the National Academy of Sciences*, 114 (39): 10384--10389.

Big data and machine learning

- **ALL SECTIONS:** Burlig, Fiona, Christopher Knittel, David Rapson, Mar Reguant, and Catherine Wolfram. 2020. "Machine learning from schools about energy efficiency," *Journal of the Association of Environmental and Resource Economists*, 7(6): 1181--1217.
- *Optional reading:* Mullainathan, Sendhil and Jann Spiess. 2017. "Machine learning: An applied econometric approach," *Journal of Economic Perspectives*, 31(2): 87--106.
- *Optional reading:* Donaldson, Dave and Adam Storeygard. 2016. "The view from above: Applications of satellite data in economics," *Journal of Economic Perspectives,* 30(4): 171--198.

Policy lab

- **ALL SECTIONS:** Rosenzweig, Mark and Chris Udry. 2014. "Forecasting Probability," *Working Paper*.
- **ALL SECTIONS:** Burlig, Fiona, Amir Jina, Erin Kelley, Gregory Lane and Harshil Sahai. 2024. "Long-range forecasts as climate adaptation: Experimental evidence from developing-country agriculture," *Working paper.*