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PPHA 34600: Program Evaluation
SYLLABUS

Instructor: Prof. Erin Kelley
Email: erinmkelley@uchicago.edu
Office Hours: Wednesday, 11:30am – 1:30pm

All-star TA team:

- *Head TA:* Xi (Alex) Lan, lanxi222@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.
- Office hours: We will hold in-person office hours, time above. We recommend that you prioritize bringing your questions to TA sessions 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 15 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 our 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 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.

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, and a take-home final exam. Problem sets will count for 15% each, the midterm will count for 30%, and the final exam will count for 40%. 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. Each assignment will receive equal weight. You may work in groups of up to three on your problem sets, ask the course TAs, and get help from Harris' R consultants, 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 we are teaching. All coding in problem sets must be done in R. Due dates are as follows:

- Problem Set 1: Tuesday, **October 15** at 9 pm.
- Problem Set 2: Tuesday, **November 19** at 9 pm.

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, all late problem sets will receive no credit. Any additional extension requests must go through the Dean of Students office.

Midterm exam: There will be an in-class midterm exam on **October 30th**. This will be a closed-book exam, meaning you will not be allowed to consult any materials during the exam.

Final exam: The take-home final exam will be assigned on Dec 4th, and due at **9 PM on Dec 9th**. You must do your own work and may not discuss the exam with anyone before it is due. Your exam must be typed and submitted electronically. All coding on the exam must be done in R. Late exams will receive a zero.

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.

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 exam deadline.

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 exam deadline.

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.

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, and receiving any unapproved assistance on exams. 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

Week 3-1: Problem Set 1 due (October 15th)

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 exam (October 30th)

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

Week 8-1: Problem Set 2 due (November 19th)

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

Week 10-1: Final Exam due (**December 9th**)

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

- 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

- Christensen, Darin, Oeindrila Dube, Johannes Haushofer, Bilal Siddiqi, and Maarten Voors. Forthcoming. "Building resilient health systems: Experimental evidence from Sierra Leone and the 2014 Ebola outbreak," *The Quarterly Journal of Economics*.

Randomized controlled trials II

- 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

- 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.*

Evaluation of evaluations

- Spurlock, Anna, Peter Cappers, Jing Lin, Annika Todd, and Patrick Baylis. 2016. "Go for the silver? Evidence from field studies quantifying the difference in evaluation results between

'gold standard' randomized controlled trial methods versus quasi-experimental methods," *ACEEE Summer Study on Energy Efficiency in Buildings*, 2-1--2-13.

Selection on observables

- Chetty, Raj, John N. Friedman, and Jonah E. Rockoff. 2014. "Measuring the impacts of teachers II: Teacher value-added and student outcomes in adulthood," *American Economic Review,* 104 (9): 2633--2679.
- 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

- 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

- 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

- 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

- 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

- 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

- 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

- 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

- 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 I

- Du Puy, Tristan and Jeffrey G. Shrader. 2024. "Costs of Climate Adaptation: Evidence From French Agriculture," *Working Paper*.
- Rosenzweig, Mark and Chris Udry. 2014. "Forecasting Probability," *Working Paper*.

Policy lab II

- 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.*