

**ECON 590 (M2)**  
**Applied Econometrics: Advanced Topics in Program Evaluation and Policy Analysis**  
MSPE, Department of Economics  
Fall 2017

**Instructor:**

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**Lectures:** Tuesday/Thursday, 2:00 pm-3:50pm in DKH 111

**Office Hours:** 4:00-5:15 Tues & 1:45-3:30 Wed. Schedule time [here](#). Can also schedule alternative appointment if necessary.

**Course Description:** This course will cover key techniques in applied econometric research, with a focus on program evaluation and policy analysis. Techniques covered will include experiments, regression and matching, instrumental variables, difference-in-differences, synthetic control, regression-discontinuity, prediction, and meta-analysis. We will discuss the properties of each of these techniques and illustrate them using examples from health policy, education policy, workforce development programs, environmental and labor market regulations, and economic development programs. Students will gain experience applying the techniques to study different policies using real-data sets and evaluating others' research. Students will finish the course by proposing their own program evaluation.

**Course Goals:** This course has three goals:

- 1) Become informed consumers of research and news regarding evaluation and analysis of public and private policies.
- 2) Give students experience conducting data analysis themselves.
- 3) Learn about the role of evaluation and analysis in policymaking.

**Prerequisites:** Econ 502 and 503 are strongly recommended for individuals taking this course. Please schedule a meeting with me if you have not completed these courses. The course assumes that students have knowledge of calculus, linear algebra, and basic statistics and econometrics. In particular, students should be familiar with basic multivariate calculus (first and second derivatives and how to obtain them), matrices and matrix operations, basic properties of random variables, calculating expectations, variances, correlations, conditional expectations and conditional variances, and multiple linear regression.

**Credits:** 4 credits

**Course structure:** The course will be a lecture, along with discussion and activities. Students are expected to attend all classes and participate in all discusses. I will cold call throughout the semester. Computers and phones are not allowed out during class at any point.

**Learning Resources:**

The two textbooks for this course are:

- *Mostly Harmless Econometrics*, by J. Angrist and S. Pischke (2008)
- *'Mastering 'Metrics; The Path from Cause to Effect,'* by J. Angrist and S. Pishke (2014)

Additional materials, as well as assignments and practice materials will be available on Illinois Compass (<http://compass.illinois.edu>). Announcements about assignments, readings, and other course items will be posted on Compass.

This course will use R, which is a free statistical computing language. R can be downloaded at <http://www.r-project.org>. Additional background materials on R will be provided throughout the course.

### **Requirements:**

- Assignments: There will be 6 assignments that together will count for 25 points (25% of the grade). They will be due on:
  - Assignment 1: September 12<sup>th</sup>
  - Assignment 2: September 26<sup>th</sup>
  - Assignment 3: October 17<sup>th</sup>
  - Assignment 4: October 31<sup>st</sup>
  - Assignment 5: November 30<sup>th</sup>
  - Assignment 6: December 12<sup>th</sup>
- Midterms: There will be 2 midterms which each count for 150 points (15% of the grade)
  - Midterm 1: October 3<sup>rd</sup>
  - Midterm 2: November 7<sup>th</sup>
- Research Project: December 12<sup>th</sup> (15 points, 15% of the grade)
- Final Exam: There will be a closed book, 3-hour exam during finals week which will cover the entire course material and be worth 300 points (30%) of the grade. The final exam is currently scheduled for Wednesday, December 20<sup>th</sup> from 7:00-10:00pm. Location TBD.

**Assignments:** Will be mixture of problem sets and other assignments.

**Research Project:** Students will propose their own program evaluation or other piece of policy analysis. More details to come.

**Grading:** Grades will be on a +/- scale and may follow a light curve.

### **Assessment Policies:**

#### *Assignment Policies:*

All assignments are to be turned in at the beginning of the class in which they are due. Late assignments receive *no* credit without an instructor approved excuse. Acceptable excuses include physical and mental illness, and personal or family emergencies. A written request for an extension must be submitted at least 48 hours in advance.

Assignments can be turned in early at your instructor's office or via email. You are encouraged to work as a group with your classmates on problems sets, although you have to hand in your own solutions.

Note that we cannot grade assignments that we cannot read. Consequently, please be careful to make all assignments legible.

#### *Exam Policy:*

In the event that a student misses one of the exams, the instructor reserves the right to give the student a zero on that exam. There are no make-up exams without an instructor approved excuse. Instructor approved excuses include 1) medical reasons, in which case you should bring a letter from a medical professional describing your reason for missing the exam, 2) death or serious illness of an immediate

family member or close friend (documentation required), or 3) conflict with a religious holiday. Requests for exam make-ups should be made as far in advance as possible.

We will follow the University guidelines on student conflicts with final exams. For this year's student code, see [http://admin.illinois.edu/policy/code/article3\\_part2\\_3-201.html](http://admin.illinois.edu/policy/code/article3_part2_3-201.html).

**Regrades:**

All regrade requests must be submitted in writing no more than one week after the assignment or exam is returned. The request must be written and include a detailed summary of why the student believes the grade they received was incorrect. I generally regrade the entire exam or assignment, so the grade may go up or down. Consequently, students should only request a regrade if they are very confident that the original grade they received was incorrect.

**Statement on Academic Integrity**

We will follow Articles 1-401 through 1-406 of the *Student Code* (beginning at [http://studentcode.illinois.edu/article1\\_part4\\_1-401.html](http://studentcode.illinois.edu/article1_part4_1-401.html)). This rule defines infractions of academic integrity, which include, but are not limited to, cheating, fabrication, and plagiarism. You are responsible for following these guidelines (ignorance is no excuse). If you have any questions about whether something would be an infraction, consult with the instructor before proceeding.

**Requests for Special Accommodations:**

To obtain disability-related adjustments and/or auxiliary aids, students with disabilities must contact the course instructor and the Disability Resources and Educational Services (DRES) as soon as possible. To contact DRES, you may visit 1207 S. Oak St., Champaign, call (217)-333-4603, email [disability@illinois.edu](mailto:disability@illinois.edu) or go to the DRES website.

Please also schedule a private meeting with the course instructor to discuss your needs and requirements. The instructor will attempt to meet all reasonable course accommodations once the student self-identifies. Please note that accommodations are not retroactive to the beginning of the semester, but begin the day you contact the instructor with a current letter of accommodation from DRES.

**Emergency Response Recommendations:**

The university maintains guidelines for emergency responses. A list of recommendations when to evacuate and when to find shelter are available at:

[http://illinois.edu/cms/2251/general\\_emergency\\_response\\_recommendations\\_8\\_16\\_13\\_final.docx](http://illinois.edu/cms/2251/general_emergency_response_recommendations_8_16_13_final.docx)

Floor plans for specific buildings are available at: <http://police.illinois.edu/emergency-preparedness/building-emergency-action-plans/>

## Course Schedule (tentative)

1	Aug 29	Course overview and logistics
	Aug 31	Causality
2	Sept 5	Randomized trials
	Sept 7	Hypothesis testing
3	Sept 12	Power (Assignment #1 due)
	Sept 14	Block randomization
4	Sept 19	Noncompliance and IV
	Sept 21	Observational studies and regression
5	Sept 26	Matching and regression
	Sept 28	Propensity scores (Assignment #2 due)
6	Oct 3	Exam # 1
	Oct 5	Instrumental variables
7	Oct 10	Instrumental variables: LATE
	Oct 12	Regression discontinuity
8	Oct 17	Regression discontinuity continued (Assignment # 3 due)
	Oct 19	Difference-in-differences
9	Oct 24	Difference-in-differences continued
	Oct 26	Synthetic control
10	Oct 31	Inference in synthetic control and DiD
	Nov 2	(Assignment # 4 due)
11	Nov 7	Exam # 2
	Nov 9	When is a causal estimate not enough?
12	Nov 14	Introduction to prediction
	Nov 16	Using prediction to inform policy: case study 1
13	Nov 21	Thanksgiving Break
	Nov 23	Thanksgiving Break
14	Nov 28	Using prediction to inform policy: case study 2
	Nov 30	Meta-analysis (or other advanced topic) (Assignment # 5 due)
15	Dec 5	Meta-analysis (or other advanced topic)
	Dec 7	Meta-analysis (or other advanced topic)
16	Dec 12	Final thoughts (Assignment # 6 and research proposal due)