

PUBPOL 639/EDUC 794
Quantitative Methods for Program Evaluation

Winter 2018

Instructor: Silvia Robles (srobles@umich.edu)

Office hours: Monday & Wednesday 2:30-4:30pm (Signup via Google calendar)

Weill Hall Office 5207

GSI #1: Desmond Cole (drcole@umich.edu)

Office Hours: TBD (Signup via Google calendar)

GSI #2: Pedro Magana Saenz (pmaganas@umich.edu)

Office Hours: TBD (Signup via Google calendar)

Lecture: Monday & Wednesday 1:00-2:30pm, 1120 Weill Hall

Sections: Fridays 1:30-3:00pm, 1120 Weill Hall

Final Exam: Tuesday, April 24 from 4:00-6:00 pm in 1120 Weill Hall

Overview and Objectives

This course introduces students to multiple regression analysis and other tools of causal inference and program evaluation. The course will focus on applying these tools to real data on various policy topics. Applications will be drawn from a wide range of policy areas including education, welfare, unemployment, discrimination, health, immigration, the environment, and economic development.

The course has two highly related objectives:

- 1) Train students to thoughtfully produce their own empirical research. With the wide availability of data and statistical software, there are very few technical barriers to conducting empirical research. All you need is an internet connection and Excel. However, producing good and convincing empirical research is another matter entirely.

In this course, we will develop the core analytical tools of single and multi-variable regression and also discuss fixed effects, difference-in-differences, natural experiments, instrumental variables, regression discontinuities, event studies, and matching approaches. Throughout, the focus will be on real world applications, understanding the strengths and weaknesses of each approach, and communicating methods and findings in plain English.

- 2) Train students to critically consume empirical research done by others, as well as claims about empirical relationships made by others. We will teach you to read and understand empirical research and to judge whether it constitutes a firm basis for policy. This should serve you in your future role as a policy or business analyst, researcher, policy-maker, manager, or voter.

Prerequisites

The course requires introductory statistics (hypothesis testing, t-statistics, confidence intervals) at the level of PUBPOL 529 or EDUC 793. Students taking one of these courses concurrently will *not* be allowed to enroll in 639. Introductory calculus and microeconomics are strongly recommended but not strictly required.

Readings

Since the course is primarily a methods course, the majority of readings will be from one of the course textbooks. Both are required and should serve as a useful reference in your future work:

- 1) Stock and Watson, Introduction to Econometrics 3rd edition (any edition should be fine).
- 2) Angrist and Pischke, Mastering Metrics. Paperback edition.

The textbook readings will be supplemented with additional readings including academic journal articles and policy reports. These readings will be provided on Canvas or via web links. All readings should be done before lecture.

Section

Your GSI will be leading section every Friday. Sections will mostly be used to demonstrate how to put quantitative methods into practice using Stata and to provide guidance on the problem sets.

The GSI may occasionally use the time to clarify material covered in lecture or the readings. Section attendance is strongly encouraged.

Grading

- In-class Quizzes (4) 30%
Short in-class quizzes will test material from both the reading and lectures. Quizzes cannot be made up, so plan your schedule accordingly. Your lowest quiz score will be dropped. The quizzes are closed-book. You may consult a single index card of notes during the quizzes, and use a calculator*. However, no cell phones are allowed.
- Homework Assignments (6) 25%
Homework assignments consist of data analysis and short essays (1- 2 paragraphs) that interpret your findings and evaluate the methods in readings. They are graded on a three-point scale: check (=acceptable), check-plus (=great), check-minus (=deficient). For the purpose of comparing problem set grades to quiz and exam grades, a check-plus will count as 95%, a check will count as 85% and a check-minus will count as 75%. Students who do not turn in the assignment

at all will receive a score of 50% for the purpose of calculating the final course grade. You are encouraged to discuss the assignments in groups of three or four, but your answers must be written up individually, in your own words. So that we may confirm that you have written up answers in your own words, list your study group members on your problem set. The lowest homework score will be dropped.

Problem sets should be typed, converted to a PDF, and uploaded to the course website. Stata do-files and log files should accompany all your assignments (in the same PDF). The final assignment will ask you to describe and critically evaluate two empirical papers which I provide to you and will be done in small groups.

- **Class Participation 15%**
I expect you to attend and participate in class regularly. During each class, I may ask questions of randomly selected students. This is intended to generate democratic participation. Questions will be based on the reading, assignments, problem sets and lectures. Your class participation grade will also be based on your participation in the learning catalytics exercises in class. You will receive 2 points for a correct answer, 1 for an incorrect answer, and zero for no answer (e.g. you were not in class).
- **Final Exam 30%**
A comprehensive final exam will be held Friday 4/24 from 4:00- 6:00 pm in 1120 Weill Hall. The exam is closed-book. You may consult a single page of notes during the exam, and use a calculator*, but no cellphones will be allowed. There will be no alternate arrangements made for the final, so please plan accordingly.

*Only pocket calculators, no graphing calculators.

Software

We will do analysis in Stata, a software program used widely by policy analysts. We provide links to online Stata tutorials and offer training within the first few sections. You can access Stata in one of three ways:

1. Stata is available for license or purchase for a very affordable price. Order through the Stata website <http://www.stata.com/order/new/edu/gradplans/student-pricing>. I recommend Stata/IC (as of the writing of this syllabus, a 6mo license was \$45, a 12-mo license was \$89, and a perpetual license was \$198).
2. Stata is available in the computing labs across campus.
3. Access is available through Virtual Sites at UM. For more information see <http://www.itcs.umich.edu/sites/labs/virtual.php>

In addition, the class will use Learning Catalytics (LC) for real-time interaction during lecture. Unlike i-clickers, LC technology requires no special hardware. It is a "bring your own device" technology and works with any device with a web browser (smart phone,

laptop, tablet). If you do not already own such a device for every class, please let me know by email by this Friday, 1/5. I do not expect anyone to buy a device with a web browser for these purposes, so if you do not have one, I will work with you to arrange one for class use. I will always bring a few i-pads to class for student use.

By Tuesday, January 9, I expect you to have your LC account set up at learningcatalytics.com and be ready to use LC during class. The cost is \$12 per student for 6 months. If you do not have access to a credit card for this purpose, please see me as soon as possible and I can facilitate setting up your account.

Here are the instructions for setting up an account (from the LC website help section):

1. On the Learning Catalytics home page, click Create student account in the menu bar.
2. Select the 6 month \$12 purchase option, and then read/accept Privacy Policy and License Agreement.
3. Indicate whether you already have a Pearson Education account, and then either supply your existing account credentials or create a new account when you're prompted.
4. Enter credit card information and complete the transaction.

Note: For the first class, I will provide you with the session ID number. Thereafter, you will be linked to my course and any class sessions will automatically come up in your account.

Laptops

To keep us focused on the class, laptop use will not be permitted during class. I will distribute copies of overhead slides for you to take notes on and will post a pdf of the slides after lecture.

Quiz and Assignment Schedule

All assignments are due by 11:59 pm on the date listed. Answers should be posted using the assignment tool in Canvas in a single pdf file. Assignments will be distributed 7-14 days before due date. Quizzes will be in lecture and will begin promptly at 1:40 pm. They will last about 20 minutes. Quizzes will be cumulative, but focused on the most recent material.

Accommodations

If you need an accommodation for a disability, please let me know as soon as possible. (Of course, if a problem arises during the semester, you should see me as soon as you can). Some aspects of this course may be modified to facilitate your participation and progress. As soon as you make me aware of your needs, we can work with the Office of Services for Students with Disabilities to help us determine appropriate accommodations. I will treat any information you provide as private and confidential.

Ford School Academic Expectations

Please review the discussion of the Ford School's statement on academic integrity, student mental health and wellbeing, inclusivity, and expectations for communications, attendance, assignments, and technology here:

<http://fordschool.umich.edu/academics/expectations>

Diversity and Inclusivity

Members of the Ford School community represent a rich variety of backgrounds and perspectives. We are committed to providing an atmosphere for learning that respects this diversity. While working together to build this community we ask all members to:

- Share their unique experiences, values and beliefs,
- Be open to the views of others,
- Honor the uniqueness of their colleagues,
- Appreciate the opportunity that we have to learn from each other in this community,
- Value one another's opinions and communicate in a respectful manner,
- Keep confidential discussions that the community has of a personal (or professional) nature,
- Use this opportunity together to discuss ways in which we can create an inclusive environment in Ford classes and across the UM community.

We also recognize the importance of advancing diversity, equity, and inclusion in the study and practice of quantitative methods specifically. Sometimes DEI issues will be central to the topic, such as when we use quantitative methods to measure the extent of racial discrimination in the labor market. Other times DEI issues bubble below the surface, such as when we classify people into discrete categories for the purpose of analysis, even if these categories are an inadequate representation of individuals' lived experiences. Instead of confining this critical and complicated topic to one lecture, these issues will be integrated throughout the semester. Within each lecture, I will strive to raise questions related to diversity, equity, and inclusion as it may be relevant to the particular lecture topic. I also encourage you to propose questions, topics, and examples from your experience throughout our time together.

Student Mental Health and Well-being Resources

The University of Michigan is committed to advancing the mental health and wellbeing of its students. We acknowledge that a variety of issues, such as strained relationships, increased anxiety, alcohol/drug problems, and depression, directly impacts students' academic performance. If you or someone you know is feeling overwhelmed, depressed, and/or in need of support, services are available. For help, contact Counseling and Psychological Services (CAPS) and/or University Health Service (UHS). For a listing of

other mental health resources available on and off campus, visit:
<http://umich.edu/~mhealth/>.

Course Summary

| Date | Details | Time |
|------------------|------------------------|--------------|
| 1/3/18 | Class 1- Overview | 1:00-2:30 pm |
| 1/5/18 | Review Section | 1:30-3:00 pm |
| 1/8/18 | Class 2 | 1:00-2:30 pm |
| 1/10/18 | Class 3 | 1:00-2:30 pm |
| 1/12/18 | Review Section | 1:30-3:00 pm |
| 1/15/18 | No Class: MLK Jr. Day | |
| 1/17/18 | Class 4 | 1:00-2:30 pm |
| 1/18/18 | Assignment 1 Due | 11:59 PM |
| 1/19/18 | Review Section | 1:30-3:00 pm |
| 1/22/18 | Class 5 | 1:00-2:30 pm |
| 1/24/18 | Class 6 | 1:00-2:30 pm |
| 1/26/18 | Review Section: Quiz 1 | 1:30-3:00 pm |
| 1/29/18 | Class 7 | 1:00-2:30 pm |
| 1/31/18 | Class 8 | 1:00-2:30 pm |
| 2/1/18 | Assignment 2 Due | 11:59 PM |
| 2/2/18 | Review Section | 1:30-3:00 pm |
| 2/5/18 | Class 9 | 1:00-2:30 pm |
| 2/7/18 | Class 10 | 1:00-2:30 pm |
| 2/9/18 | Review Section | 1:30-3:00 pm |
| 2/12/18 | Class 11 | 1:00-2:30 pm |
| 2/14/18 | Class 12 | 1:00-2:30 pm |
| 2/15/18 | Assignment 3 Due | 11:59 PM |
| 2/16/18 | Review Section | 1:30-3:00 pm |
| 2/19/18 | Class 13 | 1:00-2:30 pm |
| 2/21/18 | Class 14 | 1:00-2:30 pm |
| 2/23/18 | Review Section: Quiz 2 | 1:30-3:00 pm |
| 2/26/18 - 3/2/18 | No Class: Spring Break | |
| 3/5/18 | Class 15 | 1:00-2:30 pm |
| 3/7/18 | Class 16 | 1:00-2:30 pm |
| 3/8/18 | Assignment 4 Due | 11:59 PM |
| 3/9/18 | Review Section | 1:30-3:00 pm |
| 3/12/18 | Class 17 | 1:00-2:30 pm |
| 3/14/18 | Class 18 | 1:00-2:30 pm |
| 3/16/18 | Review Section: Quiz 3 | 1:30-3:00 pm |
| 3/19/18 | Class 19 | 1:00-2:30 pm |
| 3/21/18 | Class 20 | 1:00-2:30 pm |
| 3/22/18 | Assignment 5 Due | 11:59 PM |
| 3/23/18 | Review Section | 1:30-3:00 pm |

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| 3/26/18 | Class 21 | 1:00-2:30 pm |
| 3/28/18 | Class 22 | 1:00-2:30 pm |
| 3/30/18 | Review Section | 1:30-3:00 pm |
| 4/2/18 | Class 23 | 1:00-2:30 pm |
| 4/4/18 | Class 24 | 1:00-2:30 pm |
| 4/5/18 | Assignment 6 Due | 11:59 PM |
| 4/6/18 | Review Section | 1:30-3:00 pm |
| 4/9/18 | Class 25 | 1:00-2:30 pm |
| 4/11/18 | Class 26 | 1:00-2:30 pm |
| 4/13/18 | Review Section: Quiz 4 | 1:30-3:00 pm |
| 4/16/18 | Class 27 | 1:00-2:30 pm |
| 4/24/18 | Final Exam | 4:00-6:00 pm |