

PPHA 58001 Data Analytics 1: Quantitative Analysis

Spring 2020

Mondays ◇ 7pm - 8:20pm ◇ Zoom and Canvas

Professor Katherine Baird
katherine.baird@uchicago.edu
OH: Wednesdays 5-6pm and by appointment
Zoom Link: TBD

TA: Claire Nguyen - cnguyen14@uchicago.edu
TA: Peter Li - jizhao@uchicago.edu
OH: Mondays 4:30-6pm
Zoom Link: TBD

Please note that office hours will start the second week of class.

Course Description and Goals

This class will provide an introduction to quantitative analysis for public policy. Much of the class is devoted to learning about the effects of policies and answering empirical, policy-relevant questions from observational data. In doing so, the course provides an introduction to critical, quantitative thinking in general. Students will be introduced to the basic toolkit of policy analysis, which includes sampling, hypothesis testing, regression, experiments, differences in differences, and regression discontinuity. Students will also learn how to use a statistical software program to organize and analyze data. More importantly, students will learn the principles of critical thinking essential for careful and credible policy analysis. Learning objectives for the course:

- Acquire a toolkit for policy analysis.
- Understand how to consume quantitative evidence responsibly, critically, and skeptically.
- Acquire foundational statistical programming skills.
- Understand the limitations of quantitative evidence.

Weekly Classes

Rather than require each one of you to do Zoom conferencing for 3 hours straight each week, we will be dividing the class up into several components:

1. About 1 hour of pre-recorded lecture that you will be able to access through Canvas
2. One hour to 1.5 hours of synchronous lecture via Zoom where I will be calling on students to participate and will use the breakout rooms and polling features. We will plan this to start at 7pm each Monday.
3. About 30 minutes of time devoted to posting on Discussion Board either before or after class

I will do my best to provide the pre-recorded lecture by the Friday **before** our class. If you have already blocked off 6-9pm on Mondays, then you will still have time to view the pre-recorded content before we convene for class at 7pm.

For the synchronous lectures, you can expect a combination of traditional lecture, working through examples in Stata, and group discussions. I may make use of Polls to have you work through example problems on your own. All synchronous lectures will be recorded and provided on Canvas. It should be noted that breakout room sessions will not be recorded.

There will be weekly Discussion threads posted and you will have the option of posting before or after class. Please see the "Grading and Class Deliverables" section below for more information.

Textbook and Readings

The following book is required and available in PDF format on the course website: Bueno de Mesquita, Ethan and Anthony Fowler. 2019. Critical Thinking in a Data-Driven World.

We will use the statistical software Stata for this class. Students are not expected to have any experience using statistical software or writing code prior to the course. Students will need to use Stata in order to complete the assignments. To help students learn Stata and provide hands-on practice conducting data analysis, I will often work in Stata during course sessions. For many students, it is helpful to work in Stata at the same time. Students can access Stata through vLab using their CNetID. I will provide the relevant Stata files on Canvas for students to access.

The following online resources may be useful for students learning to use Stata. We will also provide helpful information in class. <http://stats.idre.ucla.edu/stata/seminars/notes/> <http://stats.idre.ucla.edu/stata/webbooks/reg/>

Throughout the course, I will assign several applied, required readings, usually consisting of short news articles on specific business and antitrust cases. You are responsible for doing ALL assigned readings before class.

Office Hours and Stata Bar

Throughout the quarter, the teaching assistants will hold office hours on Zoom prior to course sessions from 4:30-6:00pm. A recurring Zoom meeting will be set up and the link provided on Canvas.

In addition, each week a Teaching Assistant will offer an Office Hour / Stata Bar on Saturdays from 9:30-12:00 on Zoom. You can use this time to further your skills using Stata as well as to ask questions about the class material and assignments. The first hour will be a guided lecture via Zoom where the TA will cover examples in Stata. This will be recorded and provided on Canvas. The remaining time will be open office hours where anyone can join and ask questions.

Grading and Class Deliverables

Your final grade will be weighted as follows:

Class Participation 15%
Problem Sets 30%
Mid-Quarter Quiz 10%
Work Memo 20%
Final Exam 25%

The final letter grade received will be based somewhat on the distribution of grades in the class. However, in order to help you benchmark your grade throughout the quarter, the cutoffs below show the initial grading scale that I will use. The cutoffs may be moved down to adjust for the final distribution of the class grades.

A	A-	B+	B	B-	C+
93 or above	90-92	87-89	82-86	76-81	70-75

1. Class Participation

All students are expected to actively participate in class. Participation is central to the learning process. Students are expected to attend, engage, and make meaningful contributions to the learning experience through questions, discussion, and debate.

Since this class has moved online and is taught remotely, participation will take the form of discussion board posts. Students are expected to post in the weekly discussion threads. These posts can pertain to questions

you had from the readings (posted before class) as well as questions from the lecture (posted after class). With a remote class, this portion of the grade will be treated similarly to all other components- a lack of meaningful discussion posts will harm your grade. The instructions will be posted in the weekly thread, and I may have you post your own question, or respond to two of your classmates' threads for example. These posts and replies should be well thought-through and meaningfully contribute to the conversation.

2. Problem Sets

There are three assignments throughout the quarter. I will provide the instructions for each assignment at least 10 days prior to the due date. You may discuss problem sets and work out solutions together with other classmates. However, you should write your own solutions and perform calculations independently. If you did any discussion of the homework with your classmates, you need to **write the names of these classmates on the top of your assignment**. All assignments should be submitted through the course website in PDF format by 11:59pm on the stated due date. Please also upload any relevant Stata files. All assignments should be formatted in a professional way, as if you were presenting them to a boss, client, or colleague. If there is any confusion about the instructions or materials, it is permissible to ask specific and clarifying questions about an assignment.

3. Mid-Quarter Quiz

Rather than taking a midterm exam, you will take a 20 minute quiz in week 5. The goal of this quiz will be to help the students get feedback about their own performance in a timed situation. It will also provide feedback to the instructor for the second half of the quarter. I will likely use Canvas' quiz function to administer this assessment.

4. Work Memo

This memo is an opportunity to bring in the work that you are currently doing at our job to the classroom and the sphere of data analytics. You will first describe a current issue being faced in your workplace (whether it is a specific policy being considered, a resource allocation problem, an issue being raised by a client, or a planning consideration being taken by leadership). Then you must discuss how data analysis could contribute to solving this issue, what type of data you might and how you gain access to this data, what complications and complexities should be considered, and suggest what type of analysis should be conducted (difference-in-difference, matching, randomization, correlation analysis, etc). A rubric and guiding questions for this assignment will be posted on Canvas.

5. Exam

There will be a timed take home exam on Monday June 8th starting at 6:00pm. The exam will be provided on Canvas and students will have three hours to work through the exam. Additional time will be given for students to scan and upload their answers.

Late Work

All assignments will be posted sufficiently far in advance of the due date (at least 10 days) to provide students with ample time for completion. A late assignment will be penalized by a 20% grade reduction if it is submitted within 24 hours of the due date/time, and an assignment submitted 24-48 hours after the due date/time will be penalized by a 30% grade reduction. Assignments will not be accepted more than 48 hours after the due date/time. Keep in mind that delayed submission of assignments results in delayed posting of suggested solutions, which negatively impacts your classmates.

Contesting a Grade

If you would like to contest a grade, you must do so in writing within one week of receiving your grade for that assignment or exam. Please follow the following process for contesting a grade:

- Submit an email to the Teaching Assistant and include your reasoning for why you are requesting a re-grade referencing the suggested solutions.

- The TA will respond by re-grading your **entire assignment or exam** according to their grading rubric. Note that this could result in your grade going up, going down, or staying the same.
- If you choose not to accept the TA's response and re-grade, then you may forward your request to the professor who will then do a final re-grade of your assignment or exam.

Missed Exams

If you miss an exam without a valid, approved excuse, you will receive zero credit for the exam. All missed exams must be approved by Krisinda Doherty and the course instructor. After this approval, we will set up an alternate time and location to administer the final exam. Should you know of a reason why you may have a conflict with the final exam on Monday June 8th, please let us know as soon as possible.

Class Conduct and Professionalism

Students are expected to act with professionalism and respect throughout this course. This includes being respectful with Discussion posts on Canvas as well as interactions over Zoom.

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. 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. In addition to disciplinary sanctions, the student will receive a grade of 0 on the exam or problem set in question and cannot earn higher than a B- in the course, regardless of their performance on other assignments and exams.

The Harris policy and procedures related to academic integrity can be found at <https://harris.uchicago.edu/gateways/current-students/policies>.

The University of Chicago Policy on Academic Honesty Plagiarism can be found at <https://studentmanual.uchicago.edu/academic-policies/academic-honesty-plagiarism/>

Please note that these expectations apply to all assignments and deliverables in this class, in which your submitted work represents your commitment that it is your own independent work and that you have relied on no other individuals or resources, except as explicitly specified in the assignment instructions, in producing this work. I might also note that any chart, graph, or table you create should also contain complete source information as indicated. I encourage any students with specific questions regarding attribution, citations, etc. to contact me directly.

Diversity and Inclusion

One of my main teaching goals is to work towards presenting materials and activities that are respectful of diversity: gender, sexuality, age, disability, ethnicity, socioeconomic status, and culture. Our aim is that students from all diverse backgrounds and perspectives be well supported and served by this course, and that the diversity that students bring to this class be viewed as a strength and as a resource. Your suggestions are encouraged and appreciated. Please let me know ways to improve the effectiveness of the course for you personally or for other students or student groups. In addition, while I expect there to be rigorous discourse during our class discussions, I ask that you engage with care and empathy for the other members in the classroom.

Accommodations for Students with Disabilities

The University of Chicago seeks to provide an environment conducive to learning, teaching, working, and conducting research that values the diversity of its community. The University strives to be supportive of the academic, personal, and work-related needs of each individual and is committed to facilitating the full participation of students with a disability in the life of the University. Students with a disability, particularly those that require an

accommodation, should contact Student Disability Services (<https://disabilities.uchicago.edu/>). Upon receiving a letter of accommodation, please notify myself and your assigned academic adviser and we will coordinate to make arrangements.

Rough Course Schedule

April 6th

Introduction and Overview of the Class

Thinking and Data: Substitutes or Complements? Text Ch. 1

Correlation: What Is It and What Is It Good for? Text Ch. 2

April 13th

Causation: What Is It and What Is It Good for? Text Ch. 3

April 20th

Correlation Requires Variation, Text Ch. 4

Regression for Description and Prediction, Text Ch. 5

April 27th

Inferences about Relationships, Text Ch. 6

May 4th

Multiple Testing, Reporting Bias, Text Ch. 7

Reversion to the Mean, Text Ch. 8

May 11th

Comparing Apples to Apples, Text Ch. 9

Regression, Matching, and Controlling for Confounders , Text Ch. 10

May 18th

Randomized Experiments, Text Ch. 11

Creative Designs When We Can't Experiment, Text Ch. 12

May 25th

Memorial Day

June 1st

Assessing Mechanisms, Text Ch. 13

Measurement, External Validity, and Selected Samples, Text Ch. 15

June 8th

Take home exam