

# PPOL-502: Regression Methods for Policy Analysis (Quant 2)

SPRING 2016

## Course meetings:

Tu 6:30 - 9:00 PM, White-Gravenor (WGR) 213

## Instructor:

Paasha Mahdavi, [paasha.mahdavi@georgetown.edu](mailto:paasha.mahdavi@georgetown.edu), Old North 403.

Office Hours: W 5:00 - 7:00 PM or by appointment.

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## Course description and objectives

This class is the second course in a three-course quantitative methods sequence at the McCourt School of Public Policy. Our goal is to understand how to use quantitative analysis to make evidence-based claims on public policy issues. Our focus is on ordinary least squares (OLS) multivariate regression, with an introduction to non-linear models with binary outcomes. Topics we will cover include research design, hypothesis testing, omitted variable bias, measurement error, missing data, diagnostics and topics related to model specification. Throughout the semester we will apply these topics and tools to real policy problems both in class and in take-home assignments and projects.

By the end of the semester you will be able to . . . :

1. Understand how to apply data-based arguments to policy problems;
2. Interpret results from multivariate regression analysis;
3. Diagnose problems related to data integrity and model specification;
4. Identify potential challenges in drawing conclusions from statistical findings;
5. Use Stata to conduct basic statistical analysis.

## Prerequisites

This course is intended for students in the Master of Public Policy (MPP), Master of International Development (MIDP), and Master of Policy Management (MPM) programs. PPOL-501 (Quant 1) is the formal prerequisite for this course. Familiarity with substantive concepts in policy, economics, political science, and political economy is highly desirable but not required.

## Grading and course requirements

1. Class participation and attendance: 5%
2. Problem sets: 15%
3. Midterm exam (1 Mar): 30%
4. Group project (26 Apr): 15%
5. Final exam (10 May): 35%

## Required Book

- Michael A. Bailey. *Real Stats: Using Econometrics for Political Science and Public Policy*. Oxford University Press. 1st edition.

### *Recommended Books*

- Jeffrey M. Wooldridge. *Introduction to Econometrics: A Modern Approach*. Cengage Learning. 5th edition.
- Neil Weiss. *Introductory Statistics*. Pearson. 9th edition.
- Jane Miller. *The Chicago Guide to Writing about Multivariate Analysis*. 2nd edition.

## Course Webpage

Additional readings for the course are papers and book chapters which can be downloaded from the course webpage on Blackboard (listed as PPOL-502-02.Spring2016). I will also post lecture handouts on the course webpage prior to each class meeting as well as bring printed copies of handouts to class. In-class applications will be posted online after each class.

## Problem Sets

Problem sets will be posted on the course webpage at least one week before they are due. I will also post any data for problem sets on the course webpage. There will be six problem sets throughout the semester. They will be graded as complete / partial / incomplete. To earn full credit, you must show compelling evidence of effort to solve each problem thoroughly.

These assignments are perhaps the most important part of the course – statistics is a subject that absolutely requires learning by doing! Start working on problem sets as soon as they are posted. You can work in groups but each person must submit their problem sets individually. Note that group study can be an excellent way to learn statistics but you must put in proper

effort to fully grasp the material; simply showing up to a group study session without having reviewed and worked through the problem set is a recipe for failure. After problem sets are turned in, for some weeks we will review selected answers to problem sets during class.

## Exams

The midterm exam will be administered on March 1st in class (for a duration of 1 hour) and will cover material from the first five weeks of class. The final exam will be held on May 10th from 7:00 to 9:00 PM in a room to be determined by the registrar. It will be cumulative and cover material from the entire semester. For each exam, the teaching assistant will lead a review session one week prior to the date of the exam. Both exams are closed-book and closed-note, but the point of these exams is not memorization but rather demonstrating your understanding and application of core concepts. Exams will not be rescheduled.

## Group project

The research project for the course is a group paper on a topic that I will hand out in class on March 22nd. You are free to pick your own groups; the maximum group size is three students. You will have just over a month to complete the project but, like the problem sets, it is best to get started as soon as you receive the topic and data assignment. The project will ask you to analyze a dataset to answer a public policy problem using the techniques you will have learned in the first eight weeks of the course, with light use of the topics from the final five weeks of class. We will review some aspects of this dataset together in class as well. The paper is due in class on April 26th. You are not allowed to communicate with other groups about any aspect of the assignment.

## Participation

In order to earn full credit for participation (5% of your total grade) you must complete the required readings before each class, arrive to class on time, and **actively** participate during class. Formulating and preparing questions before class to ask during lectures is fundamental to grasping statistical concepts. Asking questions in class also helps to keep the course at the right pace. If some topics raise lots of questions, we will slow down to make sure we are reviewing concepts thoroughly and effectively; if some topics seem relatively straightforward, we will pick up the pace. Finally, please be respectful of your fellow classmates by powering off your phones during class. If you are unable to attend class for any week, you must notify me via email in advance.

## Teaching assistant

The teaching assistant for this semester is Pooja Suri. She can be reached via email at [ps940@georgetown.edu](mailto:ps940@georgetown.edu). Her office hours will be posted online after the first class.

## Course Plan

*Tentative; subject to change as the semester develops. All readings are from the Bailey textbook unless indicated as **Bb**, in which case you can find the assigned readings on the course webpage. For most weeks of the course we will work through a real data application in class, with specific topics listed below.*

Day	Topic	Application	Readings	Deliverables
19 Jan	Research design & inference		Chs. 1-2	
26 Jan	Bivariate regression	<i>Presidential elections</i>	Chs. 3-4	<b>Problem set 1</b>
2 Feb	Omitted variables & intro to multivariate regression	<i>Climate change</i>	Ch. 5	<b>Problem set 2</b>
9 Feb	Diagnostics & model specification	<i>Child test scores</i>	Ch. 5	
16 Feb	Dummy variables	<i>Crime &amp; punishment</i>	Ch. 6	<b>Problem set 3</b>
23 Feb	Interactions	<i>Energy efficiency</i>	<b>Bb</b>	
1 Mar	Transformations	<i>Oil &amp; democracy</i>	Ch. 7	<b>In-class midterm</b>
8 Mar	NO CLASS: SPRING BREAK			
15 Mar	Binary dependent variables	<i>Vote choice</i>	Ch. 12	
22 Mar	Binary dependent variables		Ch. 12	<b>Problem set 4</b>
29 Mar	Outliers & residual problems	<i>States &amp; the ACA</i>	<b>Bb</b>	
5 Apr	Time series & interdependence	<i>Human rights</i>	Ch. 13	<b>Problem set 5</b>
12 Apr	Measurement error, missing data, and other data problems	<i>Trade policy</i>	<b>Bb</b>	<b>Problem set 6</b>
19 Apr	Interactions revisited	<i>Infant mortality</i>	Ch. 10 & <b>Bb</b>	
26 Apr	Research design revisited	<i>Tobacco control</i>	Ch. 16	<b>Group project</b>
10 May				<b>Final Exam</b>

### ***Academic Resource Center/Disability Support***

If you believe you have a disability, then you should contact the Academic Resource Center ([arc@georgetown.edu](mailto:arc@georgetown.edu)) for further information. The Center is located in the Leavey Center, Suite 335 (202-687-8354). The Academic Resource Center is the campus office responsible for reviewing documentation provided by students with disabilities and for determining reasonable accommodations in accordance with the Americans with Disabilities Act (ASA) and University policies. For more information: <http://academicsupport.georgetown.edu/disability/>

### ***Important Academic Policies and Academic Integrity***

McCourt School students are expected to uphold the academic policies set forth by Georgetown University and the Graduate School of Arts and Sciences. Students should therefore familiarize themselves with all the rules, regulations, and procedures relevant to their pursuit of a Graduate School degree. The policies are located at: <http://grad.georgetown.edu/academics/policies/>

### ***Policy on Observance of Religious Holidays***

Georgetown University promotes respect for all religions. Any student who is unable to attend classes or to participate in any examination, presentation, or assignment on a given day because of the observance of a major religious holiday (see below) or related travel shall be excused and provided with the opportunity to make up, without unreasonable burden, any work that has been missed for this reason and shall not in any other way be penalized for the absence or rescheduled work. Students will remain responsible for all assigned work. Students should notify professors in writing at the beginning of the semester of religious observances that conflict with their classes. The Office of the Provost, in consultation with Campus Ministry and the Registrar, will publish, before classes begin for a given term, a list of major religious holidays likely to affect Georgetown students. The Provost and the Main Campus Executive Faculty encourage faculty to accommodate students whose bona fide religious observances in other ways impede normal participation in a course. Students who cannot be accommodated should discuss the matter with an advising dean. For more information: <http://campusministry.georgetown.edu/>

### ***Statement on Sexual Misconduct***

Please know that as a faculty member I am committed to supporting survivors of sexual misconduct, including relationship violence, sexual harassment and sexual assault. However, university policy also requires me to report any disclosures about sexual misconduct to the Title IX Coordinator, whose role is to coordinate the University's response to sexual misconduct. Georgetown has a number of fully confidential professional resources who can provide support and assistance to survivors of sexual assault and other forms of sexual misconduct. These resources are posted on the course website, and more information can be found at <http://sexualassault.georgetown.edu>