

**PPOL 512: Quantitative Methods III  
Georgetown Public Policy Institute  
Summer 2012**

**Course Syllabus**

**Professor:**

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Office Hours: Tuesdays, 4:00 – 5:30

Lectures: Mondays & Wednesdays, 6:00 – 9:10, Healy 103

**Teaching Assistant:**

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Recitation: Thursday evenings, 6:00 – 7:40, Car Barn 301

**Course Objectives**

Welcome to Quant III. The purpose of this course is to familiarize you with some of the key principles of quantitative policy analysis. We will spend our first couple of classes reviewing: 1) how to specify a regression model in a way that is suited to the data that are available to us; and 2) how to interpret output from various regression specifications. But these tools are really just means to an end. Fundamentally, we – as producers and/or consumers of policy research – are interested in causal relationships, as in: “if I pull policy lever X, what will be the effect on outcome Y?” Questions of this sort are as important as they are difficult to answer. We will therefore spend most of the semester learning how to enhance the regression techniques that you have learned in order to conduct rigorous policy analysis. Our subject material will sometimes be challenging but, if you apply yourself, you will find that it is completely manageable. And, with any luck, we’ll even have a little fun along the way!

## Course Requirements

### *Readings*

Readings will be assigned for each class meeting. You will always be assigned a textbook reading (more about that below) and one or more journal article(s)/working paper(s). The purpose of the latter is to demonstrate how the concepts that we're covering in class are incorporated into policy analysis in the "real world." It is critical that you read both the textbook and the journal articles *carefully*. In order to make sure that you're reading the articles, both the midterm and final will both contain at least one question that is worth a lot of points and that relates to an assigned article. You won't be able to answer these questions very well unless you've read the relevant articles thoroughly (in other words, our class discussions will not give you enough information to be able to answer these questions satisfactorily).

For each lecture, I will supplement the required readings with an optional item(s) for students who would like to delve a bit more deeply into the topic at hand. You are not required to read these supplemental items, but you may find them interesting and/or helpful as a way of reinforcing the course material. All assigned articles (required and optional) are available in the "Documents" folder on our Blackboard coursepage.

### *Problem Sets*

You will be assigned one problem set per week. These problems sets will be "handed out" (i.e., they will be made available on our Blackboard coursepage) on Wednesdays and will generally be due one week after they are handed out. Problem sets should be submitted to the TA (Brielle) *at the beginning of class* on the day that they are due. Problem sets submitted more than ten minutes after the start of class on the relevant due date will not be graded. Brielle will generally return your graded problem sets to you on the Monday after they are handed in. You are welcome to work together on these assignments, but it is also important that each of you masters the concepts that they cover individually. You will, after all, have to complete the exams on your own. Thus, each of you must submit your own solutions. This means that you must write your own Stata code, submit your own logs and output, etc. In other words, *literally every keystroke* required to produce your submission must have been your own. If you have any questions at all about this policy, please consult me directly. Any datasets required to complete the problem sets will be posted to our Blackboard coursepage.

A quick word on problem set grading: submissions will be graded on a check/check-minus basis. Checks will be awarded for submissions reflecting a good-faith effort to answer every question correctly. Check minuses will be assigned to problem sets that are incomplete and/or for which a good-faith effort was obviously not put forth. Zeroes will be assigned to problem sets that are not turned in or are turned in late. A check will earn you full credit for a given problem set, and a check minus will get you 50% of full credit. From a grading standpoint, then, the most important thing is that you submit complete solution sets and make an honest attempt to answer all questions correctly for every assignment. (And for those of you keeping score at home: there are five problem sets, and they account for a total of 25% of your grade. So, each problem set counts for five points toward your final grade.)

### *Exams*

The midterm exam will be held in class on Monday, 6/11, and the final exam will be held in class on Wednesday, 6/27. You are required to be present at the appropriate time and date for both the midterm and the final. Both are closed-note and closed-book.

### *Class Participation*

Given how challenging the course material is, your regular attendance will be crucial. It will be equally important that you show up for class on time. If you miss a lecture (or a portion of one), you are responsible for getting notes from somebody who was there; I will not be scheduling “make-up lectures” for students who miss class. If you know in advance that you are going to have to miss a class meeting, please notify me beforehand. I hope that, within a lecture or two, you’ll all feel comfortable participating in class discussions as often as possible. It is especially important that you ask questions whenever you feel confused. If you don’t understand something, there’s a very good chance that you’re not alone. Everyone will start out with a class participation grade of 80%. Your final class participation score will be adjusted downward to reflect nonattendance, nonparticipation, or general lack of effort. Similarly, this portion of your grade will be adjusted upward to reflect exceptional participation and effort.

### *Recitation*

You are strongly urged to attend the weekly course recitations. The recitations will focus in large part on how to use Stata to complete your problem sets, but these sessions will also reinforce many of the key concepts that we will be covering this term.

### **Software**

We will be using the Stata statistical software package (release 12). Stata is loaded onto all of the computers in the GPPI lab. I also recommend that you purchase a copy to place on your personal computers through Stata’s “gradplan” program, to which all of you have access as members of this class. Here’s the website where you can order a copy of Stata through the gradplan: <http://stata.com/order/new/edu/gradplans/gp-campus.html>

For the purposes of this class, you will only need the six-month license for “small Stata,” which is the least expensive of the versions available to you through the website. However, for those of you who will be using Stata for your thesis projects starting in the fall, you’re likely to need the “IC” version of the software instead, since small Stata can only handle very, um, small datasets. And you’ll want an annual license if you’re going to be using Stata for your thesis research in the spring. A six-month license for small Stata costs \$32, and a one-year Stata/IC license costs \$98.

## Textbook

Before class begins, please buy a copy of the following textbook, which we will use for most of the topics covered this term:

Stock, James H. and Mark W. Watson. *Introduction to Econometrics, 3<sup>rd</sup> Edition*. Boston: Addison-Wesley, 2011.

You can purchase a copy of this text at Georgetown Bookstore for about \$160 used or about \$210 new (you may also be able to get cheaper used copies online via websites such as ecampus.com and half.com).

For some lectures, we will have additional readings from one or more of the following texts:

Angrist, Joshua D. and Jorn-Steffen Pischke. *Mostly Harmless Econometrics: An Empiricist's Companion*. Princeton: Princeton University Press, 2009.

Cook, Thomas D. and Donald T. Campbell. *Quasi-Experimentation: Design & Analysis Issues for Field Settings*. Boston: Houghton-Mifflin, Company, 1979.

Long, J. Scott. *Regression Models for Categorical and Limited Dependent Variables*. London: SAGE Publications, 1997.

Murnane, Richard J. and John B. Willett. *Methods Matter: Improving Causal Inference in Educational and Social Science Research*. Oxford: Oxford University Press, 2011.

Shadish, William R., Thomas D. Cook, and Donald T. Campbell. *Experimental and Quasi-Experimental Designs for Generalized Causal Inference*. Boston: Houghton Mifflin Company, 2002.

Wooldridge, Jeffrey M. *Introductory Econometrics: A Modern Approach, Fourth Edition*. Mason, OH: South-Western Cengage Publishing, 2009.

You are not, however, required to purchase any of these additional textbooks. Copies of the relevant chapters have been placed on the coursepage.

## Course Webpage

We will be using our Blackboard coursepage quite a bit this term. Please check it regularly for announcements.

## Grading

Final course grades will be determined as follows:

|                     |     |
|---------------------|-----|
| Midterm exam        | 30% |
| Final exam          | 35% |
| Problem sets        | 25% |
| Class Participation | 10% |

**Note:** an electronic copy of this syllabus is available under the "Documents" tab on our Blackboard coursepage.

## Course Outline

*\*We will be covering roughly one topic per class meeting. But because our pace will vary from class to class, you should always read ahead by one topic.\**

### 1) **Regression Basics**

*Required Readings (these are for our first class meeting on 5/21):*

- Stock & Watson, Chapter 1 (in case some students are waiting for their copy of the textbook to arrive in the mail, a .pdf of this chapter has been uploaded to the coursepage)
- Douthat, “Sex Ed in Washington.”
- Eason, “Neighbors Push for Enforced Code...”
- Raine, “States Wage Debate over \$5.15 an Hour...”

*Optional Readings:*

- Stock & Watson, Chapters 2 – 5 (read as needed to reinforce material from Quant I & Quant II)

### 2) **Functional Form: Issues Related to Independent-Variable Specification**

*Required Readings:*

- Stock & Watson, Chapter 8
- Rodriguez, “Stata Tutorial.”

*Optional Reading:*

- Stock & Watson, Chapters 6 & 7 (read as needed to reinforce material from Quant I & Quant II)

### 3) **Functional Form: Limited Dependent Variables**

*Required Readings:*

- Stock & Watson, Chapter 11 (make sure not to skip appendix 11.3 starting on page 416)
- Munnell et al., “Mortgage Lending in Boston...”

*Optional Reading:*

- Long, pages 34 – 84

### 4) **Strategies for Identifying Causal Relationships: Randomized Experiments**

*Required Readings:*

- Stock & Watson, 9.1, 9.2, 9.4, 9.5, 13.1 – 13.3
- Card & Robins, “Do Financial Incentives Encourage Welfare Recipients to Work?...”

*Optional Reading:*

- Jemmott et al., “Efficacy of a Theory-Based Abstinence-Only Intervention...”

- 5) Strategies for Identifying Causal Relationships: Instrumental Variables**  
*Required Readings:*
- Stock & Watson, Chapter 12, 13.4 – 13.7
  - Dee, “Are there Civic Returns to Education?”
- Optional Reading:*
- Ludwig et al., “Urban Poverty and Juvenile Crime...”
- 6) Strategies for Identifying Causal Relationships: Regression Discontinuity**  
*Required Readings:*
- Cook & Campbell, pages 137 – 146
  - Angrist & Pischke, pages 251 – 267
  - Gormley & Gayer, “Promoting School Readiness in Oklahoma...”
- Optional Reading:*
- Imbens & Lemieux, “Regression Discontinuity Designs...”
- 7) Strategies for Identifying Causal Relationships: Fixed Effects**  
*Required Readings:*
- Stock & Watson, Chapter 10
  - Waldfogel, “The Effect of Children on Women’s Wages.”
- Optional Reading:*
- Currie & Thomas, “Does Head Start Make a Difference?”
- 8) Strategies for Identifying Causal Relationships: Difference in Differences**  
*Required Readings:*
- Wooldridge, Chapter 13.2
  - Shadish, Cook, and Campbell, pages 135 – 148
  - Eissa & Liebman, “Labor Supply Response to the Earned Income Tax Credit.”
- Optional Reading:*
- Card & Krueger, “Minimum Wages and Employment...”
- 9) Strategies for Identifying Causal Relationships: Matching**  
*Required Readings:*
- Murnane & Willett, Chapter 12
  - Harding, “Counterfactual Models of Neighborhood Effects...”
- Optional Reading:*
- Agodini & Dynarski, “Are Experiments the Only Option?...”
- 10) Empirical Methods and Your Thesis Project**  
*Required Readings:*
- Wooldridge, Chapter 19
  - Bryan, “The Relationship Between Childhood TANF Cash Assistance...”
- Optional Readings:*
- Leamer, “Let’s Take the Con out of Econometrics.”