

# PPPA 8022 Fall 2025

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## Course Meetings

- » Wednesdays, 6:10-8:00, 1776 G, C-101
- » Lab: selected Wednesdays, 8:10 - 10

## Course Description and Objectives

The essence of research is posing a question about how the world works, generating a hypothesis, and using evidence to test that hypothesis. This course focuses on how we use evidence to test hypotheses.

For masters' students, you should leave this course as an informed consumer of research. Is the research design you're reading credible? Why or why not? What are red flags in published research that should make you look more carefully? What are the steps required to generate a credible research product? What is causal inference, and how do you evaluate causal strategies?

For PhD students, my additional goal is to teach you how to understand estimation techniques. You may or may not use the techniques we learn in this course. Regardless, understanding their logic will help you interpret and apply empirical techniques in your own work.

This course is the second in a two-part graduate sequence in econometrics. It follows the content from PPPA 6013 and is substantially more challenging.

As a result of completing this course you should be able to

- » Apply reduced-form empirical techniques to research questions you develop
- » Replicate the data assembly and analysis in a published paper
- » Know how to apply the tools of causal policy evaluation
  - » Differences-in-differences
  - » Instrumental variables
  - » Regression Discontinuity

- » Matching
- » Read and critique causal arguments in academic papers
- » Use statistical software to implement the tools of policy evaluation

## Contact and Office Hours

### **Professor: Leah Brooks**

Media and Public Affairs Building, Room 601F

Office Hours: Mondays 10:30 am to 12:30 pm and Mondays 8:00 to 9:30 pm. By zoom unless we arrange otherwise. Please feel free to request in-person office hours.

- » Use the [scheduler](#) to book these times.
- » A zoom link is included in the confirmation email.
- » The scheduler requires you to book at least four hours in advance.
- » If there are no other students waiting, I am happy to talk beyond the 15 minute limit
- » On Monday holidays, I have created openings on the following Tuesday.

lfbrooks at gwu.edu

Contact policy: I will do my best to answer emails within 24 hours during weekdays, or within 24 hours on the soonest weekday if you email on the weekend. If you do not hear from me within this time frame, you should assume that your email has been lost and you should re-send.

If you have missed a class, your first line of defense to ask what you have missed is another student.

### **Graduate Assistant: Natalia Tosi**

natalia.tosi at gwu.edu

Office Hours: Tuesdays, 2 to 4 pm.

- » For scheduling time during office hours, [link coming!]

Contact policy: I will respond within 24 hours or on the soonest weekday.

# Prerequisites

## PPPA 6013: Econometrics for Policy Research I

This class is substantially more difficult than PPPA 6013 and requires either familiarity with statistical programming, or the ability and willingness to learn this skill while taking the course. Please see me to discuss if you are unsure whether this course is appropriate for you.

While you need to use statistical software in this class, we do not directly teach this tool directly. Because this is a PhD level course, we expect you to be able to work on your own outside of class. Our TA will do some instruction on Stata, but not a complete introduction.

I present problem set answers in Stata, but you are welcome to use the statistical package of your choice if you prefer. The TA and I can support work in Stata and R.

If you would like to learn some Stata on your own in advance of the problem sets, I highly recommend the UCLA website, which has many self-directed tutorials. If you complete the “Fundamentals of Stata 1 and 2” and the two data management tutorials [here](#) and [this](#) old (but good -- all the basic commands remain the same) tutorial, that is more than sufficient background to proceed in this class. See the resources tab for additional Stata links.

Do not do these tutorials with the expectation of mastering Stata. What you need to do is to learn enough to know diagnose problems and find solutions. This will give you the tools to find solutions for problems outside of material that you've learned directly.

## Readings

### Required textbooks

- » Angrist, Joshua D. and Pischke, Jorn-Steffen. *Mastering Metrics*
- » Cunningham, Scott. *Causal Inference: The Mixtape*, [online](#), and also available in print

The Angrist and Pischke textbook is on order at the campus bookstore, and is widely available online. The Cunningham textbook is freely available online. You can also purchase a paper copy if that is preferable. I linked to all remaining readings from this syllabus. You need to be logged in to [GW's VPN](#) to access the majority of the readings. When you are logged in, you should have access to all linked articles. Please let me know if you have difficulties with any of the links, or with permissions.

Readings are subject to change, given the pace at which we move through the material.

## Software

You are not required to use Stata for analysis in this course, but it is the program for which the TA and instructor can provide support. We can also support work in R.

Your options to access Stata are to use it in the GW library, use it on GW's cloud, buy a student version, or get an account on GW's high performance computing cluster (only feasible if you have some familiarity with Unix/linux and vi/emacs/other text editors). Reviews of GW's cloud Stata are universally poor, and I encourage you to make the investment to purchase the student version. The TA can discuss these options during lab. See the link to purchase the student version on the resources tab.

## How and Where to Submit Work

- » Create a Box Folder for you and instructors
  - » Go to <https://gwu.app.box.com/>
  - » Log in with your GW ID
  - » Inside the class folder I'll send to everyone
  - » Create a folder (new + at top right, choose folder)
  - » Name it “Last Name, First Name”, so mine would be “Brooks, Leah”
  - » Under “Invite Additional People” invite Leah Brooks and TA Natalia (emails above)
  - » Keep permissions as “Editor”
- » Submit all your work to this folder
- » Look at the assignment for how to name your files

## Weekly Plan

### *Before Class*

- » You read the assigned *Mastering Metrics* or *Causal Mixtape* text and read the assigned journal article

### *During Class*

- » Administration overview
- » Lecture, roughly half the time, on technical background for article
- » Discuss (I ask questions!) assigned journal article
- » Sometimes work in groups

## Evaluation

## 1. Problem Sets (15%)

- » The three problem sets are designed to practice the skills we learn in class
- » And to help you prepare with Stata (or other statistical software) for writing the paper
- » Turn problem sets in online at the beginning of class that they are due
- » Late problem sets receive half credit for the first 24 hours and then zero credit.
- » Problem sets should be typed
- » You're welcome to work with others, but you should each turn in your own work, in your own words
- » Grading is check plus/check/check minus (A/A-/B+)

## 2. Research Paper (52.5%)

- » 10 to 15 pages; no more than 15 pages
- » Paper is due at the final class, in class
- » Extensions given only the case of illness
- » When possible, I expect you to notify me in advance of the deadline if problems arise
- » Essays graded out of 100 points
- » Grades for essays submitted late decline by five points for each twelve hours the essay is late, e.g. if the essay is due on Friday and is received Monday, if it would have received 70%, and now receives 50%

## 3. Preparatory Work for Research Paper (7.5%) To make sure you are on track, we have three way-markers, each of which counts for two and a half percent of your grade

- » Proposal
  - » One-page outline of how to plan to proceed with the replication
- » Quantitative Progress Report
  - » Evidence that you've made progress on the quantitative front
- » In-Class Workshop
  - » Post your draft and comment on others' drafts
- » Late work for any of these way-marker projects receives a grade of zero
- » These assignments work to prepare you for the final paper; thus late work does not achieve this goal

## 4. Paper Summaries (10%)

- » For the semester, each of you will write four paper summaries
- » The three highest of these summaries count toward your course grade

- » I'll randomly assign you to these weeks; feel free to trade weeks amongst yourselves and let me know.
- » Write a one page summary of the paper we are discussing that week. At least a third of the summary should be a critique or extension of the article.

#### 5. Class Participation (5%)

- » I expect that you will come to class having done the reading and that you will be prepared to engage with me and other students in discussing the material

#### 6. Research Paper presentations (10%)

- » Comments on your classmates' presentations (5%)
- » Your presentation (5%)

## Course Material Copyright

Course materials posted on this website, Piazza, or elsewhere are intellectual property belonging to the author. Students are not permitted to buy or sell any course materials without the express permission of the instructor. Such unauthorized behavior constitutes academic misconduct.

## Accommodations

We want to provide an environment that helps every student in this course succeed. If you have accommodations of which the instructor should be aware, please inform the instructor no later than the first week of the course so we can plan together for a successful semester.

In order to receive accommodations on the basis of disability, you'll need to provide proper documentation to the [Office of Disability Support Services](#), Student Center 436, 202-994-8250. We accommodate students based on the recommendations of the DSS Office.

## GWU Policies

### University Policies

#### » *Academic Integrity Code*

Academic integrity is an essential part of the educational process, and all members of the GW community take these matters very seriously. As the instructor of record for this course, my role is to provide clear expectations and uphold them in all assessments. Violations of academic integrity occur when students fail to cite research sources properly, engage in unauthorized collaboration, falsify data, and otherwise violate the [Code of Academic Integrity](#) . If you have any questions about

whether or not particular academic practices or resources are permitted, you should ask me for clarification. If you are reported for an academic integrity violation, you should contact the Office of Student Rights and Responsibilities (SRR) to learn more about your rights and options in the process. Consequences can range from failure of assignment to expulsion from the university and may include a transcript notation. For more information, please refer to the [SRR website](#), email [rights@gwu.edu](mailto:rights@gwu.edu), or call 202-994-6757.

» *University policy on observance of religious holidays*

Students must notify faculty during the first week of the semester in which they are enrolled in the course, or as early as possible, but no later than three weeks prior to the absence, of their intention to be absent from class on their day(s) of religious observance. If the holiday falls within the first three weeks of class, the student must inform faculty in the first week of the semester. For details and policy, see [Religious Holidays](#).

» *Use of Electronic Course Materials and Class Recordings*

Students are encouraged to use electronic course materials, including recorded class sessions, for private personal use in connection with their academic program of study. Electronic course materials and recorded class sessions should not be shared or used for non-course related purposes unless express permission has been granted by the instructor. Students who impermissibly share any electronic course materials are subject to discipline under the Student Code of Conduct. Contact the instructor if you have questions regarding what constitutes permissible or impermissible use of electronic course materials and/or recorded class sessions. Contact [Disability Support Services](#) if you have questions or need assistance in accessing electronic course materials.

» *Out of Class Learning*

Average minimum amount of independent, out-of- class, learning expected per week: In a 15 week semester, including exam week, students are expected to spend a minimum of 100 minutes of out-of- class work for every 50 minutes of direct instruction, for a minimum total of 2.5 hours a week.

## Academic support

» *Academic Commons*

[Academic Commons](#) is the central location for academic support resources for GW students. To schedule a peer tutoring session for a variety of courses visit [here](#). Visit

**Academic Commons** for study skills tips, finding help with research, and connecting with other campus resources. For questions email [academiccommons@gwu.edu](mailto:academiccommons@gwu.edu).

» *Writing Center*

GW's Writing Center cultivates confident writers in the University community by facilitating collaborative, critical, and inclusive conversations at all stages of the writing process. Working alongside peer mentors, writers develop strategies to write independently in academic and public settings. Appointments can be booked **online**.

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## Support for students inside and outside the classroom

» *Disability Support Services*

202-994-8250

Any student who may need an accommodation based on the potential impact of a disability should contact **Disability Support Services** to establish eligibility and to coordinate reasonable accommodations.

» *Student Health Center*

202-994-5300, 24/7

The Student Health Center (SHC) offers medical, counseling/psychological, and psychiatric services to GW students. More information about the SHC is available **here**. Students experiencing a medical or mental health emergency on campus should contact GW Emergency Services at 202-994-6111, or off campus at 911.

## GW Campus Emergency Information

GW Emergency Services: 202-994-6111 For situation-specific instructions, refer to GW's Emergency Procedures guide.

» *GW Alert*

GW Alert is an emergency notification system that sends alerts to the GW community. GW requests students, faculty, and staff maintain current contact information by logging on to [alert.gwu.edu](http://alert.gwu.edu). Alerts are sent via email, text, social media, and other means, including the Guardian app. The Guardian app is a safety app that allows you to communicate quickly with GW Emergency Services, 911, and other resources. Learn more at [safety.gwu.edu](http://safety.gwu.edu).

» *Protective Actions*

GW prescribes four protective actions that can be issued by university officials depending on the type of emergency. All GW community members are expected to

follow directions according to the specified protective action. The protective actions are Shelter, Evacuate, Secure, and Lockdown (details below). Learn more at [safety.gwu.edu/gw-standard-emergency-statuses](https://safety.gwu.edu/gw-standard-emergency-statuses).

» Shelter

- » Protection from a specific hazard
- » The hazard could be a tornado, earthquake, hazardous material spill, or other environmental emergency.
- » Specific safety guidance will be shared on a case-by-case basis.
- » Action: Follow safety guidance for the hazard.

» Evacuate

- » Need to move people from one location to another.
- » Students and staff should be prepared to follow specific instructions given by first responders and University officials.
- » Action
  - » Evacuate to a designated location.
  - » Leave belongings behind.
  - » Follow additional instructions from first responders.

» Secure

- » Threat or hazard outside of buildings or around campus.
- » Increased security, secured building perimeter, increased situational awareness, and restricted access to entry doors.
- » Action
  - » Go inside and stay inside.
  - » Activities inside may continue.

» Lockdown

- » Threat or hazard with the potential to impact individuals inside buildings.
- » Room-based protocol that requires locking interior doors, turning off lights, and staying out of sight of corridor window.
- » Action
  - » Locks, lights, out of sight
  - » Consider Run, Hide, Fight

With many thanks to [Bobby Kleinberg](#), from whom this webpage borrows liberally.

# PPPA 8022 Spring 2025

[Syllabus](#) | **Lectures** | Resources

## Course Schedule

### Class Schedule

Lecture	Before Class	Assignments and Deadlines	Lab
<b>1</b>	Read	Assigned	
1/15	<ul style="list-style-type: none"> <li>» <i>MM</i>, Chapter 1</li> <li>» <i>Causal Mixtape</i>, Chapter 1 (Introduction), and Chapter 4.1 (Physical Randomization)</li> <li>» Harding et al, “Evaluating Contradictory Experimental and Non-experimental Estimates of Neighborhood Effects on Economic Outcomes for Adults” NBER Working Paper February 2021. <a href="#">[link]</a> <ul style="list-style-type: none"> <li>» Read pages 1 to 14.</li> </ul> </li> <li>» Supplemental               <ul style="list-style-type: none"> <li>» Helpful overview: Imbens and Wooldridge, 2009. “Econometrics of Program Evaluation,” <i>Journal of Economic Literature</i>. <a href="#">[link]</a></li> <li>» Example of controlling for observables: Brooks et al, “The Cabals of a Few or the Confusion of a Multitude” <i>American Economic Journal: Economic Policy</i> 2011. <a href="#">[link]</a></li> <li>» Unit of observation <a href="#">discussion</a> by Social Security</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>» Paper summary</li> <li>» One-page proposal instructions</li> <li>» Presentation dates</li> <li>» Problem Set 1</li> </ul>	
Causation			
	From class		
	<ul style="list-style-type: none"> <li>» Lecture notes</li> </ul>		
<b>2</b>	Read	Handouts	x
1/22	<ul style="list-style-type: none"> <li>» <i>MM</i>, Chapter 2</li> <li>» Black, Sandra et al., 2005. “The More the Merrier? The Effect of Family Size and Birth Order on</li> </ul>	<ul style="list-style-type: none"> <li>» Google <a href="#">data sheet</a> for class</li> </ul>	
Fixed Effects			

	Childrens' Education” <a href="#">[link]</a>	Due
	» skip III.D.-III.G., and sections V & VI	» One-page proposal
	From class	
	» Lecture notes	
<b>3</b>	Read	Due
1/29	» <i>Causal Mixtape</i> , Chapter 9, sections 9.1 (John Snow's Cholera Hypothesis) and 9.2 (Estimation)	» Problem Set 1
Difference-	» Milligan, Kevin. “Subsidizing the Stork: New Evidence on Tax Incentives and Fertility”, <i>Review of Economics and Statistics</i> , 2005. <a href="#">[link]</a>	Assigned
in-	» Section 5 is optional	» Problem Set 2
differences 1	From class	
	» Lecture notes	
<b>4</b>	Read	
2/5	» Janssen, Aljoscha and Xuan Zhang, “Retail Pharmacies and Drug Diversion During the Opioid Epidemic”, <i>American Economic Review</i> , 2023. <a href="#">[link]</a> .	
Difference-	» Read through Section 4	
in-	» Supplemental	
differences 2	» A interesting event study example: Garcia-Jimeno, Iglesias and Yildirim, “Information Networks and Collective Action: Evidence from the Women's Temperance Crusade”, <i>American Economic Review</i> , 2022. <a href="#">[link]</a>	
	» Bertrand et al. “How Much Should We Trust Differences-in-differences Estimates?” <i>Quarterly Journal of Economics</i> , 2004. <a href="#">[link]</a>	
	» Skim Section 4, with the exception of 4C, which you should read carefully	
	From class	
	» Lecture notes	
<b>5</b>	Read	Due
2/12	» <i>Mastering Metrics</i> , Chapter 3	» Problem Set 2
		Assigned

- Instrumental Variables 1 » Angrist and Krueger, “Does Compulsory School Attendance Affect Schooling and Earnings?”, *Quarterly Journal of Economics*, 1991. [\[link\]](#) » Problem Set 3
- » Section II.C is optional
  - » Supplemental
    - » *Causal Mixtape*, Chapter 3.1 (DAG Notation; only through 3.1.1), Chapter 7.1 (History) through 7.4 (Parental Methamphetamine)

#### From class

- » Lecture notes

- |  |   |  |   |
|--|---|--|---|
| 6<br>2/19<br>Instrumental<br>Variables 2 | Read  | Handout  | x |
|  | <ul style="list-style-type: none"> <li>» <i>Causal Mixtape</i>, Chapter 7.5 (Problem of Weak Instruments)</li> <li>» And read one of the following; we split the class between               <ul style="list-style-type: none"> <li>» Collins and Margo, “The Economic Aftermath of the 1960s Riots in American Cities: Evidence from Property Values”, <i>Journal of Economic History</i>. 2007. <a href="#">[link]</a></li> <li>» Nguyen, Hoai-Luu, “Are Credit Markets Still Local? Evidence from Bank Branch Closings” working paper, 2017. <a href="#">[link]</a> <ul style="list-style-type: none"> <li>» through page 20 is sufficient</li> </ul> </li> </ul> </li> <li>» Supplemental               <ul style="list-style-type: none"> <li>» When rain isn't a good instrument: Sarsons, Heather, “Rainfall and conflict: A cautionary tale”, <i>Journal of Development Economics</i>, July 2015. <a href="#">[link]</a></li> <li>» Bound, Baker and Jaeger, “Problems with Instrumental Variables Estimation When the Correlation Between the Instruments and the Endogeneous Explanatory Variable is Weak,” <i>Journal of the American Statistical Association</i>, 1995. <a href="#">[link]</a></li> </ul> </li> </ul> | <ul style="list-style-type: none"> <li>» Quantitative progress instructions</li> </ul> |   |

- » An entertaining **lament** from David Jaeger on the fate of this critique

From class

- » Lecture notes

**7** Read

2/26 » *Causal Mixtape*, Chapter 6.1 (Huge Popularity),  
Regression Chapter 6.2 (Estimation Using RD; only through  
Discontinuity 6.2.3)

- 1 » Anderson, Michael L., “Subways, Strikes and Slowdowns: The Impacts of Public Transit on Traffic Congestion” *American Economic Review*, 2014. [\[link\]](#)
- » Focus on Section 3, which we will discuss in class
  - » Feel free to skim Section 2 (Theoretical Model)
- » Supplemental
- » Lee and Lemieux, “Regression Discontinuity Designs in Economics,” NBER Working Paper 14723, 2009. [\[link\]](#)

From class

- » Lecture notes

**8** Read

3/5 » *Causal Mixtape*, Chapter 6.2.7 (Fuzzy RD), Chapter 6.3 (Challenges to Identification), Chapter 6.5 (Regression Kink)  
Regression  
Discontinuity

Handouts

» Workshop instructions  
Due

- 2 » Manoli and Turner, “Cash-on-Hand and College Enrollment: Evidence from Population Tax Data and the Earned Income Tax Credit” [\[link\]](#)
- » Read through Section 3.3; skim 3.4
  - » discuss fuzzy RD, RD kink

From class

- » Lecture notes

**Break**

3/12

Spring Break

<b>9</b>	Read	Handout
3/19	» <i>Causal Mixtape</i> , Chapter 5.1 (Subclassification)	» Final paper
Matching 1	» Brooks, Leah, “Volunteering to be Taxed: Business Improvement Districts and the Provision of Public Safety,” <i>Journal of Public Economics</i> 2008. <a href="#">[link]</a>	instructions Due
	» Ignore Section 6	» Quantitative summary
	» Supplemental	
	» Great notes on matching <a href="#">here</a>	
	» Todd, Petra, “A Practical Guide to Implementing Matching Estimators,” Unpublished notes, 1999. <a href="#">[link]</a>	
<b>10</b>	Student consultations in lieu of class	
3/26	» Sign-up coming	
Consultations		
<b>11</b>	Read	Handout
4/2	» <i>Causal Mixtape</i> , Chapter 10.1 (Introducing the Comparative Case Study)	» Presentation instructions
Matching 2	» Abadie, Diamond and Hainmuller, “Synthetic Control Methods for Comparative Case Studies: Estimating the Effect of California’s Tobacco Control Program,” <i>Journal of the American Statistical Association</i> , 2012. <a href="#">[link]</a>	
	» Supplemental	
	» Method overview: Abadie, Alberto, “Using Synthetic Controls: Feasibility, Data Requirements, and Methodological Aspects”, <i>Journal of Economic Literature</i> , 2021. <a href="#">[link]</a>	
	» Method critique: Kuosmanen et al, “Synthetic Control Methods: The Good, the Bad and the Ugly,” Working paper 2022. <a href="#">[link]</a>	
	» Abadie, Diamond and Hainmueller, “Comparative Politics and the Synthetic Control Method,” <i>American Journal of Political Science</i> , 2015. <a href="#">[link]</a>	

- » Pac et al, “Paid Family Leave and Breastfeeding: Evidence from California”, NBER Working Paper 25784, 2019. [\[link\]](#)
- » Brazil, Noli, “Large-Scale Urban Riots and Residential Segregation: A Case Study of the 1960s U.S. Riots” *Demography*, 2016. [\[link\]](#)

**12** Up for suggestions for first half of class

4/9

Workshop

**13** Presenters: TBD

4/16

Presentations

**14** Presenters: TBD

4/23

Presentations

. Paper done! Have a good break.

Due

4/28

» replication paper, by 5 pm

5 pm