Advanced Statistics (WWS 600C):
Approaches to Causal Inference
Mondays and Thursdays
9:00 - 12:00 AM
Robertson 015

Instructor: Scott Abramson
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Bobst Hall 3rd Floor

Office Hours: Friday 4:00-6:00 PM

Textbooks:


Course Description: This course will cover the basic tools of causal inference in social science with the goal of training sophisticated users of statistical methods. We begin by studying the fundamental principles of statistical inference. Students will then learn a variety of basic statistical methods for inference (as time permits!) including experimental methods, the linear regression model, sharp and fuzzy regression discontinuity designs, instrumental variables models, matching estimators, and panel methods. Unlike traditional courses on applied regression modeling, I will emphasize the connections between these methods and causal inference, which is a primary goal of social science research. As prerequisites I require a previous undergraduate course in statistics and comfortability with calculus.

Course Outline:

Topic 1 - Introduction & Review
(Freedman c. 3)

Topic 2 - The Experimental Gold Standard
(Freedman c. 1. Angrist & Pitschke c. 1 & 2)

Topic 3 - Simple & Multiple Regression
(Freedman c. 2, 4.; Angrist & 2 Pitschke c. 3 p. 28-68)

Topic 4 - Inference with Regression; RDD
(Freedman c. 5, Angrist & 2 Pitschke c. 6.1)

Topic 5 - Instrumental Variables
(Angrist & 2 Pitschke c. 4; Freedman c. 9.)

Topic 6 - Panel Methods
(Angrist & 2 Pitschke c. 5.)

Topic 7 - Matching vs. Regression
(Angrist & 2 Pitschke c. 3, p. 68-110)

Substantive Reading Assignments For several topics there will be selection of papers from which you must choose one to write a short one or two page response critically discussing its assumptions, identification strategy, and conclusions. Each critical response will constitute 10% of your overall grade.

Topic 2 - The Experimental Gold Standard/ Ethnicity and Politics


Topic 3 - Identification with Observational Data/ Gender and Causal Effects


Topic 4 - Regression Discontinuity/ Political Representation


Topic 5 - Instrumental Variables/ Economic History and Development


**Problem Sets:** There will be three take home exams/problem sets which you are to work on **ALONE**. Each will represent 20% of your overall grade.

**Academic Honesty:** As a Princeton student, you are to abide by the University’s honor code. All academic work must meet the standards described in the University’s constitution available at http://www.princeton.edu/honor/. Lack of knowledge of the academic honesty policy is not a reasonable explanation for a violation. Questions related to course assignments and the academic honesty policy should be directed to the instructor.

**Extra Help:** Do not hesitate to come to my office during office hours or by appointment to discuss a homework problem or any aspect of the course. You should also regularly attend the JSI tutoring sessions. Work outside of class is key to mastering the material covered in this course.