POL-GA 1120: Quantitative Analysis I

New York University, Fall 2022
Class: Wednesdays 2:00-3:50pm, 19W4 217
Lab: Wednesdays 1:00-1:50pm, 19W4

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Course Overview

This class is an introduction to both the logic and the mathematics of statistics, with an emphasis on social-science applications. Topics include basic descriptive statistics, the logic of causal order, bivariate regression, multiple regression analysis, probability, confidence intervals, significance testing, regression diagnostics, multicollinearity and heteroskedasticity. Lab sessions are largely devoted to the computer application Stata.

Course Requirements

Course grade will be based on class participation (15%), homework assignments (20%), lab project (25%) and two exams (20% each). There will be 4 problem sets, which will consist of a mix of analytical problems and computer-based problems based on the techniques covered in class. Students are allowed to discuss the problem sets with other students in class. However, each student is expected to write up their own answers. Late homework will not be accepted. The lab project will be due by Nov 30. The first exam is on October 12 and the second exam is on December 14. Class and lab attendance is mandatory.

Recommended Textbooks

The primary text used in the course will be:

Diez, David M , Barr Christopher, and Cetinkaya-Rundel Mine. OpenIntro Statistics (OIS): Fourth Edition. 2019. URL: https://www.openintro.org/book/os/

We will also use the replication datasets from:

Imai, Kosuke (2018). *Quantitative Social Science: An Introduction*, Princeton University Press.

Pollock, Philip and Barry Edwards.*A Stata Companion to Political Analysis* (4th Edition), CQ Press, 2019.

Course Schedule

Date	Topic	Readings
Sep. 7	Introduction: Causality, Research design	
Sep. 7	Science and Statistics	OIS Chapter 1
Sep. 14	Descriptive Statistics	OIS Chapter 2
Sep. 21	Lab: Application I	
Sep. 21	Least Squares Regression	OIS Chapter 8.1
Sep. 28	Lab: Application II	
Sep. 28	Linear Regression	OIS Chapter 8.2
Oct. 5	Lab: Application III	
Oct. 5	Review	
Oct. 12	Exam 1	
Oct. 19	Lab: Week 1 Project	
Oct. 19	Basic Probability	OIS Chapter 3.1
Oct. 26	Lab: Week 2 Project	
Oct. 26	Conditional Probability	OIS Chapter 3.2
Nov. 2	Lab: Week 3 Project	
Nov. 2	Random Variables	OIS Chapter 3.4
Nov. 2	Probability Distributions	OIS Chapter 4
Nov. 9	Lab: Week 4 Project	
Nov. 9	Sampling Distributions	OIS Chapter 4
Nov. 9	Multiple Regression	OIS Chapter 9.1
Nov. 16	Lab: Week 5 Project	
Nov. 16	Confidence Intervals	OIS Chapter 5
Nov. 16	Hypothesis Testing	OIS Chapter 5,6, 7 & 8.4
Nov. 23	Fall Break	
Nov. 30	Lab: Week 6 Project	
Nov. 30	Model Specification	OIS Chapter 9
Dec. 7	Review	
Dec. 14	Exam 2	