Introduction to Quantitative Political Analysis

or how I learned to stop worrying and love the stats

PSC 693—Fall 2023

Department of Political Science
Syracuse University

Professor: Seth Jolly

Contact Information
Office: 325 Eggers Hall
Phone: (315) 443-8678
Email: skjolly@syr.edu

Office Hours:
Tuesday 3:30–4:30pm or by appointment
Student Drop-In Hours:
Thursday 11am–12pm in Eggers Cafe

Seminar: Tuesday 12:30–2:20pm in Eggers 100
R Lab: Tuesday 2:20–3:15pm in Eggers 100

Course Overview

This course introduces students to the basic statistical methods used in the study of political science. In the seminars and labs, you will learn to describe and analyze social science data, such as national election surveys. Throughout the course, you will also learn to understand the importance of randomness in statistical research, conduct statistical tests, present your results, and evaluate the implications of quantitative analysis. You will learn to compute most of the techniques both 'by hand' and with *R*, statistical software commonly used in political science and industry.[1]

Contemporary political science research in all subfields utilizes statistical techniques and, consequently, a basic understanding of these methods is crucial. The goal of this course is to provide students with the statistical tools necessary to become a sophisticated consumer and producer of quantitative research.

Course Expectations and Requirements

Homework

Homework will be assigned at least three times during the semester, with each assignment worth 100 points. You will have one week to complete the assignments. Late assignments will receive a penalty of 10 points per day. You may work in groups when completing your assignments, but the finished assignments must reflect your own, individual interpretations of the results. You will also have occasional *R* lab assignments.

Exams

The mid-term and final exam will be take-home exams based on the material covered in class and the readings. The final exam will not be cumulative, although the second half of class clearly builds on the first half. These exams will be similar to the homeworks except that you are expected to work alone, *with* the aid of your notes and texts.

---

[1]If you are interested in learning *Stata*, we can discuss tutorials and options for that software as well.

Project

In the research project, you will develop an interesting, testable hypothesis. You will need to obtain an appropriate data set and analyze this hypothesis using the statistical tools from class. You will not necessarily need to conduct extensive outside research or elaborate a full literature review. The focus of the paper should be describing and analyzing the data. The finished product should be no more than $10-15$ pages but it can be part of a bigger project (e.g., for another class). We will have time to work on the projects in lab. I will hand out further instructions in class.

Participation

As a graduate seminar, each participant will be expected to attend class and be prepared to discuss the assigned readings. Active student participation is essential to a successful seminar.

Learning Outcomes

This course has three main goals:

- To help you understand the uses and importance of statistical methods in political science.
- To help you develop skills to analyze social science data using basic statistical methods.
- To help you improve the writing and presentation skills associated with quantitative methods.

Evaluation

Homeworks	20%	Mid-term Exam	25%
Final Exam	25%	Project Presentation	5%
Final Project	25%		

Required Readings

Required books available at the SU bookstore. Other readings available in Blackboard.

Agresti, Alan. 2017. *Statistical Methods for the Social Sciences.* 5th ed. Pearson. [This book is also available as an ebook from `coursesmart.com` or `amazon.com`, either as a rental or purchase.]

Strausz, Michael. 2023. *Are you ready for R? A Workbook for R for Political Science and Beyond.* Spring 2023 edition. Available at: https://www.michaelstrausz.com/r-workbook [Blackboard][2]

Supplementary Books

These books offer different approaches, with varying degrees of sophistication. These books are not required, but if you want to learn more about a specific topic, these are good resources.[3]

Achen, Christopher. 1977. *Interpreting and Using Regression.* Beverley Hills, CA: Sage.

Griffiths, William E., R. Carter Hill, and George G. Judge. 1993. *Learning and Practicing Econometrics.* NY: Wiley & Sons Publishers.

Imai, Kosuke. 2017. *Quantitative Social Science. An Introduction.* Princeton University Press.

Healy, Kieran. 2019. *Data Visualization: A Practical Introduction.* Princeton University Press.

Pollock III, Philip H. and Barry Clayton Edwards. 2017. *An R Companion to Political Analysis.* 2nd Edition. Washington D.C.: CQ Press.[4]

Statistical software

In this course, we will be learning and using R in the **RStudio** app. **RStudio** is a free app available at `rstudio.com` and it is also available in ITS supported computer labs, such as Life Science 215.

---

[2]We will also be making use of other online R tutorials at times to supplement the book especially with ggplot and tidyverse, including *R for Data Science* at `https://r4ds.had.co.nz`.

[3]Increasingly, there are open-source and free textbook options, including http://www.openintro.org. This website offers video lectures too, in case you are interested in another view on a topic.

[4]This book is particularly helpful with weighted data but primarily uses packages created for the book (so not base R or tidyverse).

Seminar Schedule

Week 1 (Tuesday, 29 August)

Seminar 1. Introductions and Overview

Achen, Christopher. 2002. "Advice for Students Taking a First Political Science Graduate Course in Statistical Methods." *The Political Methodologist* 10.2 (Spring): 10–12. [Blackboard]

King, Gary. 2020. "So You're a Grad Student Now? Maybe You Should Do This." *Sage Handbook of Research Methods in Political Science*, eds. Robert J. Franzese, Jr. and Luigi Curini. Sage Publications. [Blackboard]

Bueno de Mesquita, Ethan and Anthony Fowler. 2021. Ch. 1 " Thinking Clearly in a Data Driven Age." *Thinking Clearly with Data.* Princeton University Press. [Blackboard]

Lab 1. Hello *R*

Strausz Ch. 1 "Getting Started with R" and Ch. 2 "Welcome to the tidyverse."

*** *If you are using your own laptop for **R**, you should download **R** and **R** Studio before class. If you have any issues, feel free to come to lab early to discuss.*

Week 2 (Tuesday, 5 September)

Seminar 2. Statistical Methodology, Sampling and Measurement

Agresti Chs. 1–2

Bueno de Mesquita, Ethan and Anthony Fowler. 2021. Ch. 3 "Causation: What is it and What is it good for?" *Thinking Clearly with Data.* Princeton University Press. [Blackboard]

Lab 2. Descriptive Statistics

Strausz Ch. 3 "Graphing and describing variables."

Week 3 (Tuesday, 12 September)

Seminar 3. Descriptive Statistics

Agresti Ch. 3

Kellstedt, Paul and Guy D. Whitten. 2019. Ch. 3 "Evaluating Causal Relationships." *The Fundamentals of Political Science Research.* Cambridge University Press. [Blackboard]

Lab 3. Transforming Variables

Strausz Ch. 4 "Recoding and comparing values of variables."

Supplementary: Strausz Ch. 10 "R in the Wild."

Week 4 (Tuesday, 19 September)

Seminar 4. Probability Distributions

Agresti Ch. 4

Trudeau, Jessie. 2022. "Limiting aggressive policing can reduce police and civilian violence." *World Development* 160. [BB]

Research topic paragraphs due in Seminar 4.

Homework 1 passed out in Seminar 4.

Lab 4. Making Comparisons and ggplot

Strausz Ch. 5 "Making controlled comparisons."

Supplementary: Wickham, Hadley, Danielle Navarro, and Thomas Lin Pedersen. 2020. Ch. 1 "Introduction." *ggplot2: Elegant Graphics for Data Analysis.* https://ggplot2-book.org/introduction.html

Week 5 (Tuesday, 26 September)

Seminar 5. Statistical Inference: Estimation

Agresti Ch. 5

Bakker, Ryan, Seth Jolly, and Jonathan Polk. 2020. "Multidimensional Incongruence, Political Disaffection, and Support for Anti-Establishment Parties." *Journal of European Public Policy.*

Homework 1 due in Seminar 5.

Lab 5. *More* Tables and Graphs

Healy, Kieran. 2019. Ch. 5 "Graph Tables, Add Labels, Make Notes" *Data Visualization: A Practical Introduction.* Princeton University Press. [Blackboard]

Supplementary: Kastellec, Jonathan and Eduardo L. Leoni. 2007. "Using Graphs Instead of Tables in Political Science." *Perspectives on Politics* 5.4 (December): 755–771.

Week 6 (Tuesday, 3 October)

Seminar 6. Statistical Inference: Significance Tests

Agresti Ch. 6

Homework 2 passed out in Seminar 6.

Homework 2 due Friday 6 October.

Take-home mid-term emailed out on Friday 6 October.

Lab 6. Inferences about Sample Means

Strausz Ch. 6 "Making inferences from sample means."

No Seminar or Lab: Fall Break (Week of 10/9)

Week 7 (Tuesday, 17 October)

Seminar 7. Comparison of Two Groups

Agresti Ch. 7

Smith, Gregory. 2019. "Secret but Constrained: The Impact of Elite Opposition on Covert Operations." *International Organization* 73.3 (Summer): 695–707. [BB]

Exam due Tuesday 17 October.

Dataset selection for paper submitted via email by 17 October.

Lab 7. Open lab time

Conduct simple descriptive tables and graphs using your chosen dataset.

Week 8 (Tuesday, 24 October)

Seminar 8. Analyzing Associations

Agresti Ch. 8

Lab 8. Measures of Association

Strausz Ch. 7 "From chi-squared to Somers' D."

Week 9 (Tuesday, 31 October)

Seminar 9. Linear Regression & Correlation

Agresti Ch. 9

Bartels, Larry M. 1990. "Five Approaches to Model Specification." *Political Methodologist* 3.2: 2–6.

Supplementary: Llaudet, Elena and Kosuke Imai. 2023. *Data Analysis for Social Science.* Princeton University Press, Ch. 4 "Predicting Outcomes Using Linear Regression" (98–128).

Lab 9. Correlation and Regression

Strausz Ch. 8 "Pearson's r and linear regression."

Week 10 (Tuesday, 7 November)

Seminar 10. Multiple Regression & Correlation

Agresti Ch. 10–11 (skim pages 331–337)

Supplementary: Brambor, Thomas, William Roberts Clark and Matt Golder. 2006. "Understanding Interaction Models: Improving Empirical Analyses." *Political Analysis* 14.1: 63–82.

Final project outline due in Seminar 10.

Homework 3 passed out in Seminar 10.

Lab 10. Multiple Regression

Strausz Ch. 9 "Multiple regression."

Week 11 (Tuesday, 14 November)

Seminar 11. Multiple Regression & Correlation (cont'd)

Agresti Ch. 13 (skip 401–411)

Agresti Ch. 14, especially 14.2+

Homework 3 due in Seminar 11.

Lab 11. Graphing Models & Presenting Results

Supplementary: Healy, Kieran. 2019. Ch. 6 "Work with Models." *Data Visualization: A Practical Introduction.* Princeton University Press. [Blackboard]

Everyone should resolve dataset issues by this week.

Thanksgiving Break: Week of November 20th

Week 12 (Tuesday, 28 November)

Seminar 12. Logistic Regression

Agresti Chs. 15 and 16 (skim pages 480–484)

Lab 12. Logistic Regression

Week 13 (Tuesday, 5 December)

Seminar 13. Review

Final Exam passed out in Seminar 13. Final Exam due Friday, 8 December.

Lab 13. Regression Diagnostics (Friday, 8 December)

Week 14 (Tuesday, 12 December)

Seminar 14. Project Presentations

Final Project due at 12:00pm on 19 December via turnitin.

University Policies

Academic Integrity

Syracuse University's Academic Integrity Policy reflects the high value that we, as a university community, place on honesty in academic work. The policy holds students accountable for the integrity of all work they submit and for upholding course-specific, as well as university-wide, academic integrity expectations. The policy governs citation and use of sources, the integrity of work submitted in exams and assignments, and truthfulness in all academic matters, including course attendance and participation. The policy states that any work a student submits for a course must be solely their own unless the instructor explicitly allows collaboration or editing. The policy also requires students to acknowledge their use of other peoples' language, images or other original creative or scholarly work through appropriate citation. These expectations extend to the new, fast-growing realm of artificial intelligence (AI) as well as to the use of websites that charge fees or require uploading of course materials to obtain exam solutions or assignments. For more information and the complete policy, see https://class.syr.edu/academic-integrity/. For more information and the complete policy, see https://class.syr.edu/academic-integrity/.

Academic dishonesty will not be tolerated. If I suspect academic dishonesty or plagiarism, I will submit formal reports to the Dean of the College of Arts and Sciences. Also, http://www.plagiarism.org is a useful website for tips on citations and other writing resources.

Statement Regarding Disability-Related Accommodations

Syracuse University values diversity and inclusion; we are committed to a climate of mutual respect and full participation. There may be aspects of the instruction or design of this course that result in barriers to your inclusion and full participation in this course. I invite any student to contact me to discuss strategies and/or accommodations (academic adjustments) that may be essential to your success and to collaborate with the Center for Disability Resources (CDR) in this process.

If you would like to discuss disability-accommodations or register with CDR, please visit Center for Disability Resources. Please call (315) 443-4498 or email disabilityresources@syr.edu for more detailed information.

The CDR is responsible for coordinating disability-related academic accommodations and will work with the student to develop an access plan. Since academic accommodations may require early planning and generally are not provided retroactively, please contact CDR as soon as possible to begin this process.

Religious Observances Policy

SU's religious observances policy recognizes the diversity of faiths represented in the campus community and protects the rights of students, faculty, and staff to observe religious holy days according to their traditions. Under the policy, students are given an opportunity to make up any examination, study, or work requirements that may be missed due to a religious observance, provided they notify their instructors no later than the academic drop deadline. For observances occurring before the drop deadline, notification is required at least two academic days in advance. Students may enter their observances in MySlice under
My Slice/StudentServices/Enrollment/MyReligiousObservances/Add a Notification.

Campus Resources

There may be times during the semester that you need assistance, academically or otherwise. There are a wide variety of campus resources that may be able to help. Please consider using help when you need it. If you don't know what type of help you need, you can ask me or other faculty.
- Counseling Center: counselingcenter.syr.edu/faculty-staff/helping-students-in-distress.html
- Writing Center: https://thecollege.syr.edu/writing-center/
- Tutoring Services: Center for Learning and Student Success: https://class.syr.edu

- Financial Counseling: http://financialaid.syr.edu/financialliteracy/
- Career Services: https://thecollege.syr.edu/student-success
- Other personal health resources:
dailyorange.com/2018/08/heres-breakdown-personal-health-resources-available-su-students\

Last updated: September 26, 2023.