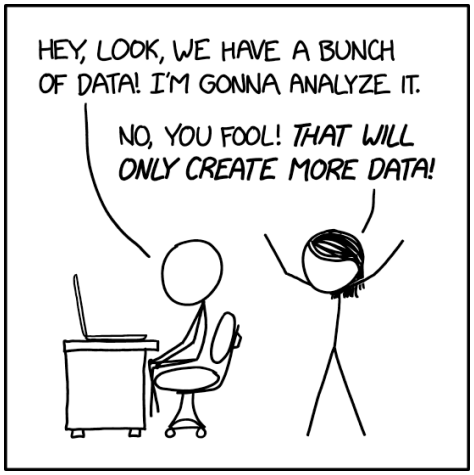
POLS 7012: Introduction to Political Methodology

Fall 2024

Professor:	Joe Ornstein	**Time:**	W 4:10 – 6:55pm
Email:	jornstein@uga.edu	**Place:**	101D Baldwin Hall
Website:	https://joeornstein.github.io/pols-7012/		

This course will introduce the foundational mathematical and computational skills you will need to conduct and evaluate political science research. During the first half of the semester (Part 1: Fundamentals), we discuss the techniques that political scientists use to address three fundamental problems of scientific inquiry: measurement, causal inference, and sampling. In the second half of the semester (Part 2: Applications), we apply what we've learned to a series of miniature research projects, focusing on the practical computational skills you need to work with data. By the end of the semester, you will be armed with the necessary tools to tackle the more advanced material that makes up the rest of our graduate methods sequence.



Course Objectives

By the end of this course, you will be able to:

- Confidently work with data using the `R` programming language
- Create beautiful and informative data visualizations
- Organize your work so that it is transparent and reproducible
- Build basic statistical models and estimate their parameters from data
- Communicate the uncertainty around your estimates
- Identify research designs that credibly address three fundamental challenges of social science: measurement, causal inference, and sampling.

Assignments & Grading

Each week I will assign 1-2 chapters of reading and a problem set, both due at noon the day of class. Feel free to work collaboratively with your classmates on the problem sets, but please submit your answers individually. **Resist the temptation to copy-paste your classmates' code.** You are much more likely to learn if you type your responses yourself. 70% of your grade will come from these problem sets, and 15% each from a take-home midterm and final exam.

Office Hours and Email Policy

I will be available for students to drop in and chat every Monday, Wednesday, and Friday afternoon from 1:30-3pm. My office is Baldwin 304C. If you send me an email, please allow me 24 hours to respond. Like many professors, my inbox is pretty overloaded. Also, I have small children, so it's my policy to not check email after 5pm or on weekends. You should feel free to seek assistance from the senior graduate students staffing the SPIA Methods Helpdesk. You can email them questions at spia-methods-help@uga.edu.

Books

Our readings will come from the two books listed below. The first book (DAFSS) must be purchased, but the second (R4DS) is freely available online.

- **DAFSS:** Llaudet, Elena & Imai, Kosuke (2022). *Data Analysis for Social Science: A Friendly and Practical Introduction.* Princeton University Press.
- **R4DS:** Wickham, H., Cetinkaya-Rundel, M., & Grolemund, G., (2023). *R For Data Science: Import, Tidy, Transform, Visualize, and Model Data, 2nd Edition.* O'Reilly Media, Inc.

Course Outline

PART 1: FUNDAMENTALS

Week 1: Getting Started

Introductions, The Three Fundamental Problems of Scientific Inquiry
Reading Due: None

Week 2: Writing Code

Setting Up R and RStudio, Tidy Datasets, Variables, Basic Programming
Reading Due: DAFSS Chapter 1

Week 3: Experiments

Causal Inference, Potential Outcomes, Randomization, Estimation
Reading Due: DAFSS Chapter 2

Week 4: Samples

Descriptive Statistics, Representative Samples, Distributions, Basic Data Visualization
Reading Due: DAFSS Chapter 3

Week 5: The Linear Model

Regression, Logarithms, Prediction
Reading Due: DAFSS Chapter 4

Week 6: Causality

Confounders, Multiple Regression, Internal and External Validity
Reading Due: DAFSS Chapter 5

Week 7: Probability

Sampling Distributions, Expected Value, Variance, Normal Distributions, Bernoulli Distributions, Central Limit Theorem, Law of Large Numbers
Reading Due: DAFSS Chapter 6

Week 8: Uncertainty

Hypothesis Testing, Confidence Intervals, Standard Errors, p-values, Integrals, The Fundamental Theorem of Calculus
Reading Due: DAFSS Chapter 7

PART 2: APPLICATIONS

Week 9: Visualize Your Data

ggplot2, Exploration, Communication
Reading Due: R4DS Chapters 1-2

Week 10: Transform Your Data

Data Wrangling, Filtering, Summarizing, Code Style
Reading Due: R4DS Chapter 3-4, 12

Week 11: Tidy Your Data

Pivoting, Scripts, and Projects
Reading Due: R4DS Chapter 5-6

Week 12: Import & Export Your Data

Pivoting, Scripts, and Projects
Reading Due: R4DS Chapter 7-8

Week 13: Merge Your Data

Keys, Joins, Fuzzy Record Linkage
Reading Due: R4DS Chapter 19

Weeks 14-15: Final Projects

Review, Catchup, Bonus Topics, Final Presentations

Academic Honesty

Remember that when you joined the University of Georgia community, you agreed to abide by a code of conduct outlined in the academic honesty policy called *A Culture of Honesty*. You may work on problem sets in groups, but I expect you to submit individual responses, and the midterm and final must be completed individually.

Mental Health and Wellness Resources

- If you or someone you know needs assistance, you are encouraged to contact Student Care and Outreach in the Division of Student Affairs at 706-542-7774 or visit https://sco.uga.edu. They will help you navigate any difficult circumstances you may be facing by connecting you with the appropriate resources or services.
- UGA has several resources for a student seeking mental health services or crisis support.
- If you need help managing stress anxiety, relationships, etc., please visit BeWellUGA for a list of FREE workshops, classes, mentoring, and health coaching led by licensed clinicians and health educators in the University Health Center.
- Additional resources can be accessed through the UGA App.