

**Course:** POLS 4150

**Title:** Research Methods in Political Science

**In-person Class Meetings:** MWF, 10:20am - 11:10am

**Location:** Baldwin Hall 101D

**Term:** Spring 2025

**Professor:** David Cottrell

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**Office Hours:** Friday 1:30 – 2:30pm or by appointment @ Baldwin Hall 380D.

### **COURSE DESCRIPTION:**

Scholars in political science and in disciplines across the social sciences are increasingly relying on quantitative, data-driven methods to answer important questions in their field. This course provides an introduction to the study of politics through quantitative reasoning and data analysis. We will cover the fundamentals of empirical research in political science including causal inference, summary statistics, data visualization, and regression. However, unlike a traditional research methods course, this course places a particular emphasis on developing technical skills used to conduct real world data analysis. Therefore, a significant amount of the coursework will be dedicated to learning how to program in the statistical computing environment, R. The goal is for you to gain a valuable skillset in data analysis that you can use in your political science classes and, more importantly, in your future careers.

### **PREREQUISITES:**

You do not need any prior experience with coding. The class is designed to help you develop these skills without such experience. Nevertheless, you should be aware that there is a steep learning curve to coding. It will require time, effort, practice, and patience.

### **REQUIRED TEXTS:**

**TEXTBOOK:** Llaudet and Imai. *Data Analysis for Social Science: A Friendly Introduction*. Princeton University Press

Chapter 1...	Introduction
Chapter 2...	Estimating Causal Effects with Randomized Experiments
Chapter 3...	Inferring Population Characteristics via Survey Research
Chapter 4...	Predicting Outcomes Using Linear Regression
Chapter 5...	Estimating Causal Effects with Observational Data
Chapter 6...	Probability
Chapter 7...	Quantifying Uncertainty

The eBook can be purchased [here](#). Data for the textbook can be found on ELC or [here](#).

### **LAPTOPS:**

We will be conducting data analysis in class so that you can practice the skills that you've learned. To conduct data analysis, we will be using the R statistical computing environment on your computer. Please bring your laptops with R installed to every class.

## **STATISTICAL SOFTWARE**

For data analysis, we will be using R, which is an open-source (free!) statistical computing environment widely used for manipulating data, performing statistics, and producing graphics. To run R, we will take advantage of a commonly used integrated development environment (IDE) called RStudio. RStudio provides a user-friendly interface for accessing and computing in R. Complete the following steps:

- 1) First, go to <https://cran.r-project.org> and follow the links to download R. Be careful to download the correct R package for your system's platform. Pay close attention to your system's operating system and processor. Once you've downloaded the proper R package to your computer, open it and follow the instructions to install.
- 2) Second, go to this [website](#) to download RStudio Desktop by clicking on the big blue button listed under the second step. Follow the instructions to install.

## **METHOD OF INSTRUCTION:**

This course will be taught face-to-face. Instruction will consist of lectures and in-class assignments. You must attend class in-person, as there is no online alternative.

## **EVALUATION:**

- (50%) In-class data assignments** – You will complete ten in-class data assignments over the course of semester. These assignments are designed to help you apply the concepts discussed in the readings and lectures by analyzing real-world data using R. There will be dedicated time in class for you to work on the assignments, allowing you the opportunity to ask questions and receive guidance. However, you may need to allocate additional time outside of class to complete the work. All assignments must be submitted to ELC by the specified due date.
- (15%) Midterm 1** – The first midterm exam will be completely online and will be made available in eLC on Friday, February 14<sup>th</sup>. You will have four days to begin the exam and 24 hours to complete the exam once you have begun. The midterm will cover chapters 1–3.
- (15%) Midterm 2** – The second midterm exam will be completely online and will be made available in eLC on Friday, March 21<sup>st</sup>. You will have four days to begin the exam and 24 hours to complete the exam once you have begun. The midterm will cover chapters 1–5.
- (20%) Final** – The final exam will be completely in-person on May 2<sup>nd</sup>. You will need to bring your laptop to the exam and be prepared to analyze a dataset in R. The final will be cumulative, but will emphasize concepts learned in chapters 7 and 6.

Grade scale:

A	94.0000 and above
A-	93.9999 to 90.0000
B+	87.0000 to 89.9999
B	86.9999 to 83.0000
B-	82.9999 to 80.0000
C+	77.0000 to 79.9999
C	76.9999 to 70.0000
D	65.0000 to 69.9999
F	64.9999 and below

**COURSE AGENDA:**

WK	DAY	DATE	TEXT	TOPIC
0	M W F	01/06 01/08 01/10	----- ----- -----	Syllabus NO CLASS NO CLASS
1	M W F	01/13 01/15 01/17	Ch. 1 Ch. 1 Ch. 1	Introduction to RStudio and programming in R Introduction to RStudio and programming in R Assignment 1
2	M W F	01/20 01/22 01/24	----- Ch. 2 Ch. 2	NO CLASS Causal inference and treatment effects Causal inference and treatment effects
3	M W F	01/27 01/29 01/31	Ch. 2 Ch. 3.1 - 3.4 Ch. 3.1 - 3.4	Assignment 2 Inferring population characteristics, descriptive statistics, histograms Inferring population characteristics, descriptive statistics, histograms
4	M W F	02/03 02/05 02/07	Ch. 3.4 - end Ch. 3.4 - end Ch. 3.4 - end	Exploring the relationship between 2 variables Exploring the relationship between 2 variables Assignment 3
5	M W F	02/10 02/12 02/14	Ch. 1, 2, & 3 Ch. 1, 2, & 3 Ch. 1, 2, & 3	Review Practice midterm Midterm 1
6	M W F	02/17 02/19 02/21	Ch. 4 Ch. 4 Ch. 4	Linear regression for predicting outcomes Linear regression for predicting outcomes Assignment 4
7	M W F	02/24 02/26 02/28	Ch. 5.1 - 5.3 Ch. 5.1 - 5.3 Ch. 5.1 - 5.3	Linear regression for estimating causal effects Linear regression for estimating causal effects Assignment 5
	M W F	03/03 03/05 03/07	----- ----- -----	SPRING BREAK SPRING BREAK SPRING BREAK

8	M W F	03/10 03/12 03/14	Ch. 5.4 - end Ch. 5.4 - end Ch. 5.4 - end	Using linear regression to control for confounders Using linear regression to control for confounders Assignment 6
9	M W F	03/17 03/19 03/21	Ch. 5 & 6 Ch. 5 & 6 Ch. 5 & 6	Review Practice Midterm 2 Midterm 2
10	M W F	03/24 03/26 03/28	Ch. 6.1 - 6.4 Ch. 6.1 - 6.4 Ch. 6.1 - 6.4	Introduction to random variables and probability distributions Introduction to random variables and probability distributions Assignment 7
11	M W F	03/31 04/02 04/04	Ch. 6.5 - end Ch. 6.5 - end Ch. 6.5 - end	Population parameters and sample statistics. Population parameters and sample statistics. Assignment 8
12	M W F	04/07 04/09 04/11	Ch. 7.0 – 7.2 Ch. 7.0 – 7.2 Ch. 7.0 – 7.2	Quantifying uncertainty in estimators (Conf. Intervals) Quantifying uncertainty in estimators (Conf. Intervals) Assignment 9
13	M W F	04/14 04/16 04/18	Ch. 7.3 – end Ch. 7.3 – end Ch. 7.3 – end	Hypothesis testing Hypothesis testing Assignment 10
14	M W F	04/21 04/23 04/25	Ch. 6 & 7 Ch. 6 & 7 Ch. 6 & 7	Review Review Practice Final
15	M F	04/28 05/02	Ch. 6 & 7 -----	Practice Final Final (at 8am)

## **ATTENDANCE & PARTICIPATION**

You are expected to attend every class having read the assigned readings. And you are also expected to participate in classroom discussions. Your participation is not only beneficial to you individually, but it also improves the classroom learning environment.

## **UGA STUDENT HONOR CODE:**

Please adhere to the university's standards for academic honesty and integrity. Procedures for handling cases of suspected dishonesty, can be found at [www.uga.edu/ovpi](http://www.uga.edu/ovpi).

## **PREFERRED NAMES/PRONOUNS**

Professional courtesy and sensitivity are especially important with respect to individuals and topics dealing with differences of race, culture, religion, politics, sexual orientation, gender, gender variance, and nationalities. Class rosters are provided to the instructor with the student's legal name. I am eager to address you by your preferred name and/or gender pronoun. Please advise me of this preference early in the semester so that I may make appropriate changes to my records.

## **PROHIBITION ON RECORDING LECTURES**

In the absence of written authorization from the UGA Disability Resource Center, students may not make a visual or audio recording of any aspect of this course. Students who have a recording accommodation agree in writing that they:

- Will use the records only for personal academic use during the specific course.
- Understand that faculty members have copyright interest in their class lectures and that they agree not to infringe on this right in any way.
- Understand that the faculty member and students in the class have privacy rights and agree not to violate those rights by using recordings for any reason other than their own personal study.
- Will not release, digitally upload, broadcast, transcribe, or otherwise share all or any part of the recordings. They also agree that they will not profit financially and will not allow others to benefit personally or financially from lecture recordings or other course materials.
- Will erase/delete all recordings at the end of the semester.
- Understand that violation of these terms may subject them to discipline under the Student Code of Conduct or subject them to liability under copyright laws.

## **CARE IN USING THIRD-PARTY GRADING SOFTWARE**

Care should be exercised using electronic platforms for grading student assignments, exams, etc. Student information is FERPA-protected. If you are planning to use third-party software/web-based platforms for grading, please consult with EITS Computer Equipment, Software and Services at 706-542-6033 (2-6033 if using a campus landline) to ensure FERPA-protected protocols are followed.

## **CHATGPT**

ChatGPT is a large language model chatbot that uses machine learning algorithms to generate content in response to user prompts. For some instructors, ChatGPT poses challenges for classroom assignments and tests. Under the right conditions, it can also be harnessed as a learning tool. Please see these tips (<https://ctl.uga.edu/resources/documents/ChatGPT-Guidance-for-Instructorsc.pdf>) from the UGA CTL for navigating ChatGPT and other chatbots.