POLS 4150: Research Methods in Political Science *

Instructor: David Cottrell

Fall, 2020

In-class instruction:	MWF from 10:20am to 11:10am in MLC 171
Office hours:	Online by appointment

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 fundamental statistical principles underlying empirical research in political science - including causal inference, summary statistics, data visualization, and regression. Moreover, we will also learn to analyze datasets using the statistical computing environment, *R*. Unlike a traditional statistics course, this course places a particular emphasis on conducting data analysis in practice. A significant amount of the coursework will be dedicated to analyzing datasets from real-world research. The goal is for you to gain valuable skills in data analytics 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 statistical computing. Although prior experience may be helpful, the class is designed to help you develop statistical computing skills without such experience.

Method of instruction before Thanksgiving:

This course will use a flipped-classroom (or hybrid) method of instruction. Rather than hold lectures during the regularly-scheduled class period, lectures will be pre-recorded each week and posted online in eLC for students to watch from home. In-person class time will instead be dedicated to Q&A and discussion in order to give students the opportunity to engage with me and their peers face-to-face. In class, we will discuss the material assigned for that day.

Students are encouraged to attend in-person classes. However, in-person attendance is completely optional. Students who prefer not to attend class do not have to do so. I will not be taking attendance and all graded components of the course will be completed remotely. Moreover, I will be available for online meetings by appointment over Zoom.

Method of instruction after Thanksgiving:

After Thanksgiving break, the course will transition to 100% remote instruction. All remaining class sessions will take place online. I will hold class sessions using Zoom during the regular class times.

Required Text

- Imai, K. (2017). *Quantitative Social Science: An Introduction.* Princeton University Press

*The course syllabus is a general plan for the course; deviations announced to the class by the instructor may be necessary.

Statistical Software

For data analysis, we will be using R. R 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, download R and follow the instructions to install.
    - For macOS 10.13 (High Sierra) you can download R through this link: R-4.0.2.pkg. Once downloaded, double click on the file to begin installation. For older versions of macOS, please update your operating system. Otherwise, contact me.
    - For Windows, download R through this link: R-4.0.2-win.exe. Once downloaded, double click on the file to begin installation.
2. Second, download RStudio and follow the instructions to install.
    - For all operating systems go to this link and download the free version of RStudio Desktop. Then follow the instructions for installation into your applications folder.

Additional help with R

Everything you will need to know in this class will be covered in the book and in the lectures. However, you can also find a lot of information about R online. Answers to most of your questions will likely be found in online forums, blogs, and various online tutorials. For example, you can find a really great (and free) introduction to R here and some other helpful resources for learning here and here. I encourage you to check out the R blogging community here.

Computers

Bring your computer with R installed to class.

Grades

40% Homework
30% Midterm
30% Final

A	100-94%	**B**	86-84%	**C**	76-74%	**D**	66-64%
A–	93-90%	**B–**	83-80%	**C–**	73-70%	**D–**	60-63%
B+	89-87%	**C+**	79-77%	**D+**	69-67%	**F**	59-0%

Homework

I will be giving you a number of small homework assignments throughout the course of the semester. They will be posted on eLC with firm deadlines. These assignments will test you on your understanding of the material covered in lecture and in the book. And they will provide you an opportunity to practice analyzing data and programming in R. I will give you a set of questions asking you analyze some data in R. You will submit your answers electronically online by the deadline.

Online exams

There will be two exams (a midterm and a final) . The exams are designed to test your understanding of the concepts addressed in the readings and in lecture. They are also designed to test your ability to analyze data by coding in R. Both exams will be posted online and taken from home.

Ethics

UGA Student Honor Code: "*I will be academically honest in all of my academic work and will not tolerate academic dishonesty of others.*" A Culture of Honesty, the University's policy and procedures for handling cases of suspected dishonesty, can be found at www.uga.edu/ovpi. Please adhere to the university's standards for academic honesty and integrity. Do not submit someone else's code as your own. You must complete your homework and exams independently.

Accessibility Needs

Students with special needs that require accommodation should notify me and the Office for Disability Services in the first two weeks of the course so appropriate arrangements can be made. All information and documentation of special needs is confidential.

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 (https://www.uhs.uga.edu/bewelluga/bewelluga) or crisis support (https://www.uhs.uga.edu/info/emergencies).
- If you need help managing stress anxiety, relationships, etc., please visit BeWellUGA (https://www.uhs.uga.edu/bewelluga/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.

Agenda

Day	Date	Topic	Readings
F	Aug 21	Review syllabus	
M	Aug 24	Load R and Rstudio	Preface - 1.2
W	Aug 26	Object-oriented programming	1.3.0 - 1.3.2
F	Aug 28	Vectors	1.3.3 - 1.3.4
M	Aug 31	Data files and data frames	1.3.5
W	Sep 02	Subsetting data frames	1.3.6 -1.4
F	Sep 04	Experiments and tables	2.1
M	Sep 07	Labor Day	
W	Sep 09	Logical values and operators	2.2.1
F	Sep 11	Relational operators	2.2.2
M	Sep 14	Subsetting	2.2.3
W	Sep 16	Conditional statements and Factors	2.2.4 - 2.2.5
F	Sep 18	Causal effects and counterfactuals	2.3
M	Sep 21	Randomized controlled trials	2.4.1
W	Sep 23	Voter turnout experiment	2.4.2
F	Sep 25	Observational studies	2.5
M	Sep 28	Descriptive statistics	2.6
W	Sep 30	Introduction to measurement	3.1 - 3.2
F	Oct 02	Visualizing the univariate distribution	3.3
M	Oct 05	Survey Sampling and types of bias	3.4
W	Oct 07	Scatter plots	3.5 - 3.6.1

F	Oct 09	Correlation	3.6.2
M	Oct 12	Q-Q plots	3.6.3
W	Oct 14	Midterm review	
F	Oct 16	Midterm posted	
M	Oct 19	Loops	4.1.1
W	Oct 21	Conditional statements	4.1.2
F	Oct 23	Poll predictions part 1	4.1.3
M	Oct 26	Poll predictions part 2	4.1.3
W	Oct 28	Poll predictions part 3	4.1.3
F	Oct 30	Fall Break	
M	Nov 02	Intro to linear regression	4.2 - 4.2.3
W	Nov 04	Least squares	4.2.4
F	Nov 06	Model fit and R^2	4.2.6
M	Nov 09	Assessing the election	4.2.6
W	Nov 11	Regression and causation	4.3 - 4.3.1
F	Nov 13	Multivariate regression	4.3.2
M	Nov 16	Estimating the gender gap using regression	
W	Nov 18	Heterogenous treatment effects	4.3.3
F	Nov 20	Spatial data	5.3 - 5.3.3
M	Nov 23	Thanksgiving	
W	Nov 25	Thanksgiving	
F	Nov 27	Thanksgiving	
M	Nov 30	Colors in R	5.3.3
W	Dec 02	Mapping the election	5.3.5
F	Dec 04	Review	
M	Dec 07	Review	
W	Dec 09	Review	
W	Dec 16	ONLINE FINAL	