

# PSCI 2075: Quantitative Research Methods

University of Colorado Boulder

Spring 2023

<b>Time:</b>	Monday and Wednesday, 1:25-2:15
<b>Location:</b>	RAMY C250
<b>Instructor:</b>	Dr. Andrew Q. Philips
<b>Office:</b>	KTCH 131
<b>Email:</b>	andrew.philips@colorado.edu
<b>Instructor's office hours:</b>	Wednesday, 2:30-4:30, or by appointment
<b>Teaching assistants:</b>	Damon Roberts, Samantha Register, Steven Van De Laarschot and Gustavo Perez
<b>TA office hours:</b>	– 12:00-1:00 Monday and Thursday, KTCH 382 (Roberts) – 12:15-1:15 Monday and Wednesday, KTCH TBA (Register) – 10:00-12:00 Thursday, KTCH 234 (Van De Laarschot) – 10:30-12:00 Wednesday via Zoom (Perez)
<b>Methods lab coordinator:</b>	Kathryn Schauer
<b>Lab coordinator office hours:</b>	Monday (9:00-2:00), Tuesday (9:00-5:00), Wednesday (9:00-2:00), Thursday (3:00-5:00); see Canvas for Calendly appointment link

Class	Day	Time	Where	Instructor
Lecture (010)	M/W	1:25-2:15	RAMY C250	Dr. Philips
Recitation (011)	F	10:10-11:00	KOBL 140	Prof. Roberts
Recitation (012)	TH	1:25-2:15	HLMS 237	Prof. Register
Recitation (013)	TH	9:05-9:55	HLMS 237	Prof. Van De Laarschot
Recitation (014)	W	9:05-9:55	HLMS 245	Prof. Perez
Recitation (015)	T	8:00-8:50	HLMS 237	Prof. Perez
Recitation (016)	M	4:40-5:30	HLMS 245	Prof. Van De Laarschot
Recitation (017)	T	10:10-11:00	HLMS 237	Prof. Register
Recitation (018)	TH	10:10-11:00	MCOL E155	Prof. Roberts

**COURSE DESCRIPTION:** Data are all around us. Quantitative data frequently appear in the media, in politics, the workplace, and even in our own lives. This course is designed to turn you into a better consumer—and even a producer—of analyses using quantitative data. These skills are becoming increasingly more important in both public and private sector careers. And the skills learned in this course will be needed in future courses you may take in the political science department. The goal is to familiarize you with analyzing, presenting, and interpreting patterns in data. While the data used in this class will place an emphasis on the social sciences, the tools learned in this class are easily applied to many other settings.

Data analysis takes practice. To better assist you in gaining skills necessary when working with quantitative data, this course will be taught in the style of “learning-by-doing” format. Each week, there will be a series of videos for you to watch on the course’s Canvas site, as well as a lecture in class. There will also be three-person group assignments to work on; these are due roughly every other week, and involve using the statistical computer program R. No prior experience with this application

is necessary. Typically at least one class day per week will be spent working with your groups. I (and the TAs) will be available to help you answer any questions or provide assistance on assignments.

Each of you are also assigned a recitation session, which is taught by one of the course TAs. What is covered in recitation differs by week; some may delve deeper into a topic we cover in lecture. Other times it may involve allowing time to work on group assignments, or reviewing for exams and individual assignments.

Note that this is an involved, hands-on, rigorous course. Yet it is neither a math nor programming course. You will need to complete readings each week, watch all lecture videos, and work with your group to complete any assignments. You can expect to spend around 8-12 hours per week on classes/assignments/readings related to this course.

**GOALS OF THE COURSE:** By the end of this course you should be able to:

- Be a better and more engaged consumer of data
- Be familiar with examining and analyzing data using R
- Be a producer of quantitative analyses

**PREREQUISITES/REQUIREMENTS:** There are no prerequisites for this course. You will need a computer to watch any required screencasts and complete individual exams and group assignments. We will also use R and RStudio in this course. No prior experience with these applications is necessary.

**TEXTBOOKS/COURSE WEBSITE:**

There is one required textbook for the course:

- Brown, David S. *Statistics and Data Visualization Using R: The Art and Practice of Data Analysis*. Sage.

There are two optional—but *highly suggested*—textbooks for the course:

- Pollock, Philip H. III and Barry C. Edwards. 2020. *The Essentials of Political Analysis*. 6th edition. Sage.
- Pollock, Philip and Barry C. Edwards. 2018. *An R Companion to Political Analysis*. 3rd edition. Sage.

All other course materials will be available on the PSCI 2075 course website on Canvas.

**GRADES:** Course grades will be based on the following:

- **Recitation Participation/Attendance/Quizzes:** It is important to attend and participate in your recitation session. Regularly attending and being an active participant in recitation is worth 15% of your final grade. *Attendance in recitation is required*. Because ‘stuff happens’, you are allowed to have up to three absences from recitation before it starts to affect your grade.
- **Course Content Quizzes/Assignments:** There will be occasional quizzes administered for the main lecture videos, as well as any required course readings. These will be worth 15% of your final course grade. These will not be difficult, but cannot be made up without a university-excused absence. Some of these you may be able to work on in your group.

- **RStudio Group Assignments** Much of the work in this course will involve working with your group (of about 3 students each) to complete an assignment. These are due roughly every other week (and will be uploaded to Canvas), and are worth 25% of your final grade. Groups will be assigned in the first two weeks of classes, based on recitation session.
- **Midterm:** About halfway through the semester, a take-home midterm exam will be administered. You will have a 24 hour window in which to take the exam, and will upload you answers to Canvas. The midterm is an individual assignment; you will need to work on your own to complete the exam. The midterm will be worth 20% of your final grade. This will be cumulative, so everything we have learned up to this point is fair game.
- **Final Exam:** At the end of the semester, a take-home final exam will be administered during the final exam time scheduled for this course. You will have a 24 hour window in which to take the exam, and will upload you answers to Canvas. The final is an individual assignment; you will need to work on your own to complete the exam. The final will be worth 25% of your final grade. This will be cumulative, so everything we have learned up to this point is fair game.

Recitation Participation/Attendance/Quizzes	15%
Course Content Quizzes/Assignments	15%
RStudio Group Assignments	25%
Midterm	20%
Final Exam	25%

The following scale will be used to turn numerical grades into letter ones. Note that I will round up a letter should your grade fall on the number (but on or above 0.5) between two letters (e.g., 89.5 up to 90 rounds up to an A-).

#### Grade Scale

A	95-100
A-	90-94
B+	87-89
B	84-86
B-	80-83
C+	77-79
C	74-76
C-	70-73
D+	67-69
D	64-66
D-	60-63
F	0-59

**EXTRA CREDIT AND LATE WORK:** Throughout the semester there *may* arise opportunities for extra credit. These will typically involve attending a lecture or attending a speaker series, and will be announced in class.

Sometimes the need arises to turn in assignments late. Group assignments can be turned in late, but will lose a full letter grade for each day late (e.g., what would be graded as an A- is now a B-). However, after three full days have passed after the due date, the assignment will receive a score

of 0. Recitation and lecture quizzes cannot be made up without a university-excused absence. The midterm and final exam also cannot be turned in late without a university-excused absence.

**CONTACT WITH INSTRUCTORS:** While office hours are a great time to ask questions, please feel free to email me and the TAs. During the week, you can typically expect to receive a response within 24 hours. If you have gone more than 48 hours without a response (weekends excepted), please send a follow-up email.

When you write your email, ensuring that it is both professional and clear is the best way to get a complete answer to your question. Try to clearly identify the question you have. Since many of your questions will revolve around R, it may be necessary to attach a screenshot, or even include code that you're stuck on.

### **TENTATIVE SCHEDULE:**

#### **Weeks 1-2: Jan 18, 23, 25 (no class Jan 16–MLK day)**

Course introduction and introduction to R

Required Readings:

- Brown, Preface, Chapter 1 and 13
- Chapter 1 of *Essentials of Political Analysis* (EPA)

Suggested Readings:

- Introduction, Chapter 1 of *An R Companion to Political Analysis* (RCPA)

#### **Week 3: Jan 30, Feb 1**

Introduction to descriptive statistics

Required Readings:

- Brown, Chapter 2
- EPA, Chapter 2 (up to p. 55)
- RCPA, Chapter 2

#### **Week 4: Feb 6, 8**

Intro to descriptive statistics (continued). Transforming variables

Required Readings:

- Brown, Chapter 3
- EPA, Chapter 2, p. 55-on
- RCPA, Chapter 3

#### **Week 5: Feb 13, 15**

Graphical presentations of data

Required Readings:

- Brown, Chapter 4

## **Week 6: Feb 20, 22**

Controlled Comparisons

Required Readings:

- Brown, Chapter 5
- EPA, Chapter 5 (up to p. 146)
- RCPA, Chapter 4

## **Week 7: Feb 27, Mar 1**

Bivariate regression

Required Readings:

- Brown, Chapter 6
- EPA, Chapter 3 (p. 72-85)

Suggested Readings:

- RCPA, Chapter 8

## **Week 8: Mar 6, 8**

Multiple regression

Required Readings:

- Brown, Chapter 7
- EPA, Chapter 8 (up to p. 260)
- RCPA, Chapter 9 (up to p. 151, 156-157)

## **Week 9: Mar 13, 15**

Dichotomous variables and interactions

Required Readings:

- Brown, Chapter 8
- EPA, Chapter 5 (p. 146-158), Chapter 8 (260-267)
- RCPA, Chapter 9 (p. 151-154)

## **Week 10: Mar 20, 22, MIDTERM EXAM**

Midterm held on March 22. March 20 will be review.

## **Week 11: SPRING BREAK**

No class

## **Week 12: Apr 3, 5**

Making inferences, statistical significance, and the Central Limit Theorem

Required Readings:

- Brown, Chapter 9
- EPA, Chapter 6
- RCPA, Chapter 6

## **Week 13: Mar 10, 12**

Making inferences, statistical significance, and the Central Limit Theorem (continued) Required Readings:

- EPA, Chapter 7 (p. 199-215, 231-232)

## **Week 14: Apr 17, 19**

Post-estimation and regression diagnostics

Required Readings:

- Brown, Chapter 10

Suggested Readings:

- EPA, Chapter 8 (p. 267-271)

## **Week 15: Apr 24 and 26**

Logistic regression and predicted probabilities

Required Readings:

- Brown, Chapter 11
- EPA, Chapter 9
- RCPA, Chapter 10
- Browse through the Zelig website: <http://docs.zeligproject.org/articles/quickstart.html>

## **Week 16: May 1 and 3**

Course review; this week will be devoted to doing exercises in class that will help prepare for the final.

## **FINAL EXAM: TBA**

The final will be held on TBA, in which you will have a 48 hour window in which to take the exam.

## **SYLLABUS CHANGES**

I reserve the right to make changes to the syllabus during the course of the semester as needed and will make the most updated copy available to you on Canvas, and announce said changes during class.

**Last updated:** January 16, 2023

## **UNIVERSITY-MANDATED STATEMENTS**

### **Classroom behavior**

Both students and faculty are responsible for maintaining an appropriate learning environment in all instructional settings, whether in person, remote or online. Those who fail to adhere to such behavioral standards may be subject to discipline. Professional courtesy and sensitivity are especially important with respect to individuals and topics dealing with race, color, national origin, sex, pregnancy, age, disability, creed, religion, sexual orientation, gender identity, gender expression, veteran status, political affiliation or political philosophy. For more information, see the policies on [classroom behavior](#) and the [Student Code of Conduct](#).

### **Requirements for COVID-19**

As a matter of public health and safety due to the pandemic, all members of the CU Boulder community and all visitors to campus must follow university, department and building requirements, and public health orders in place to reduce the risk of spreading infectious disease. Required safety measures at CU Boulder relevant to the classroom setting include:

- maintain 6-foot distancing when possible,
- wear a face covering in public indoor spaces and outdoors while on campus consistent with state and county health orders,
- clean local work area,
- practice hand hygiene,
- follow public health orders, and
- if sick and you live off campus, do not come onto campus (unless instructed by a CU Healthcare professional), or if you live on-campus, please alert CU Boulder Medical Services.

Students who fail to adhere to these requirements will be asked to leave class, and students who do not leave class when asked or who refuse to comply with these requirements will be referred to Student Conduct and Conflict Resolution. For more information, see the policies on COVID-19 Health and Safety and classroom behavior and the Student Code of Conduct. If you require accommodation because a disability prevents you from fulfilling these safety measures, please see the "Accommodation for Disabilities" statement on this syllabus.

All students who are new to campus must complete the COVID-19 Student Health and Expectations Course. Before coming to campus each day, all students are required to complete the Buff Pass.

Students who have tested positive for COVID-19, have symptoms of COVID-19, or have had close contact with someone who has tested positive for or had symptoms of COVID-19 must stay home. In this class, if you are sick or quarantined, you must contact the instructor and/or TAs. You do not need to disclose the nature of your illness.

### **Accommodation for disabilities**

If you qualify for accommodations because of a disability, please submit your accommodation letter from Disability Services to your faculty member in a timely manner so that your needs can be addressed. Disability Services determines accommodations based on documented disabilities in the academic environment. Information on requesting accommodations is located on the [Disability Services website](#). Contact Disability Services at 303-492-8671 or [dsinfo@colorado.edu](mailto:dsinfo@colorado.edu) for further assistance. If you have a temporary medical condition or injury, see [Temporary Medical Conditions](#) under the Students tab on the Disability Services website.

## **Preferred student names and pronouns**

CU Boulder recognizes that students' legal information doesn't always align with how they identify. Students may update their preferred names and pronouns via the student portal; those preferred names and pronouns are listed on instructors' class rosters. In the absence of such updates, the name that appears on the class roster is the student's legal name.

## **Honor code**

All students enrolled in a University of Colorado Boulder course are responsible for knowing and adhering to the Honor Code. Violations of the policy may include: plagiarism, cheating, fabrication, lying, bribery, threat, unauthorized access to academic materials, clicker fraud, submitting the same or similar work in more than one course without permission from all course instructors involved, and aiding academic dishonesty. All incidents of academic misconduct will be reported to the Honor Code (honor@colorado.edu); 303-492-5550). Students found responsible for violating the academic integrity policy will be subject to nonacademic sanctions from the Honor Code as well as academic sanctions from the faculty member. Additional information regarding the Honor Code academic integrity policy can be found at the Honor Code Office website.

## **Sexual misconduct, discrimination, harassment and/or related retaliation**

The University of Colorado Boulder (CU Boulder) is committed to fostering an inclusive and welcoming learning, working, and living environment. CU Boulder will not tolerate acts of sexual misconduct (harassment, exploitation, and assault), intimate partner violence (dating or domestic violence), stalking, or protected-class discrimination or harassment by members of our community. Individuals who believe they have been subject to misconduct or retaliatory actions for reporting a concern should contact the Office of Institutional Equity and Compliance (OIEC) at 303-492-2127 or cureport@colorado.edu. Information about the OIEC, university policies, [anonymous reporting](#), and the campus resources can be found on the [OIEC website](#).

Please know that faculty and graduate instructors have a responsibility to inform OIEC when made aware of incidents of sexual misconduct, dating and domestic violence, stalking, discrimination, harassment and/or related retaliation, to ensure that individuals impacted receive information about options for reporting and support resources.

## **Religious holidays**

Campus policy regarding religious observances requires that faculty make every effort to deal reasonably and fairly with all students who, because of religious obligations, have conflicts with scheduled exams, assignments or required attendance. In this class, I will try to accommodate your requests, but you must contact me early in the semester.

See the [campus policy regarding religious observances](#) for full details.