

PSC 2101: Scope and Methods of Political Science
Department of Political Science, George Washington University
Spring 2023 ~ Thursdays, 11:10-1:00 ~ Corcoran Hall (COR) 101a
TA Sections: Tuesdays, 9:35-10:25 -or- 11:10-12:00 (both in 1957 E St., Elliott School, 212)

Professor Brandon Bartels
E-mail: bartels@gwu.edu

Office: Monroe 474

Office hours: Thursdays, 1:30-3:00 or by appointment (Zoom or in person)

Teaching Assistant: Kerry Synan (Ph.D. Candidate)

Email: ksynan@gwmail.gwu.edu

Office: Monroe 409

Office hours: Wednesdays, 11:00-1:00 or by appointment (Zoom or in person)

Course Description

Why did Joe Biden win the 2020 U.S. presidential election? Would stricter gun laws reduce the incidence and severity of mass shootings? Do economic sanctions against foreign governments, such as North Korea, work? You have undoubtedly debated questions such as these with your family, friends, colleagues, and fellow students. In this course, we will develop skills designed to answer such questions, thereby enhancing our understanding of the world of politics and public policy. The course does not focus on any one specific topic in political science (e.g., presidential elections, gun laws, economic sanctions), but rather on *how* to study these topics. Employing modern computational tools, the course covers a variety of topics within a “data science” framework. Topics include: data visualization, examining relationships between variables, transforming and “setting up” data, hypotheses, regression analysis and statistical inference. We will also put these concepts and tools into practice by focusing on applications and communication of results and evidence.

Learning Objectives

As a result of completing this course, students will:

- Improve their ability to process and analyze data using modern computational tools.
- Have a deeper understanding of the appropriate ways to summarize simple and complex relationships between political variables.
- Learn best practices for how to communicate analyses and evidence.

Textbook (Free)

Ismay, Chester, and Albert Y. Kim. 2019. *Statistical Inference via Data Science: A Modern Dive into R and the Tidyverse*. CRC Press. Available for **free** online: <https://moderndive.com/>

Data Analysis and Statistical Software: R and R Studio (Free)

We will use the popular, powerful software package “R” in this class. You will access R using the more user-friendly “R Studio” package. You will need to download both R and R Studio. We will go over all of these details on the first day of class. After the first day of class, I expect that students will bring their laptops to class, have R and R Studio installed, and be ready to use R Studio in both the main class and TA sections.

We will also use a feature of R Studio called “Quarto,” which is built right in to R Studio. Quarto is a powerful software tool that is capable of integrating your results from R analyses with your narrative for explaining your results. It is especially valuable for communicating your results in a paper, report, or analysis memo. It’s like a more intricate yet more powerful version of Microsoft Word. It can generate documents, papers (like what you’d write as a Word document), and reports in both .pdf and .html format. You can also use Quarto to create a webpage or even presentation slides (akin to Powerpoint). Quarto also incorporates the Latex infrastructure. Quarto also works with other programs, such as Python and Julia, which make it extremely useful and flexible beyond R. You will use Quarto to complete your assignments, your final paper/project, and your presentation slides for your research presentation (see below). As a sidenote, Quarto is a more generalized, powerful version of a similar program within R Studio called “R Markdown.”

R and Quarto are very popular in academia, data science, and the programming industry (private sector and government). Importantly, you will attain valuable analytical, programming, data analytic, and statistical skills in this class that you can list on your resume. These skills are quite marketable, as employers across fields highly value these types of skill sets.

Data

Data analysis requires “data.” Where do data come from? Some data come from public opinion surveys that measure people’s attitudes, preferences, and evaluations of political issues and politicians. Other data come from researchers’ efforts to measure characteristics of countries around the world or the 50 states in the U.S. When researchers do experiments, they generate data consisting of individuals who are randomly assigned to a treatment or a control group. Finally, you may have heard of “[big data](#),” which can entail analyzing and attempting to synthesize extremely large volumes of information, e.g., millions of Twitter responses on a particular topic.

In this class, we’ll work with relatively large “datasets” consisting of many observations (individuals, countries, U.S. states) and many “variables” (measured characteristics of those observations). This is sometimes called “large-n” data, where “n” is the number of observations in a dataset. We analyze a large number of observations so that we can make generalizations and inferences about the population. The datasets we will work with in this class (and that you will work with in your data assignments and final project) include various types of survey data (including political and public opinion surveys) and data analyzing characteristics of countries around the world and the U.S. states. We will discuss these issues in class on a recurring basis, and you will access a variety of datasets both from our textbook and from what I provide to you.

Blackboard Discussion Forum

We will be using Blackboard for additional class discussion. That format is highly catered to getting you help quickly and efficiently from classmates and from me and Kerry. Rather than emailing questions to just me and/or Kerry, I encourage you to post your questions on Blackboard. If you’re having problems with the R code you’re using, you should copy and paste your code so we can see exactly where the problem may be occurring. If you have non-technical questions that are not appropriate for the class, just email only me and/or Kerry.

Time Budgeting

Students are expected to spend a minimum of 100 minutes of out-of-class work for every 50 minutes of direct instruction. There are 2.5 hours of direct instruction and a minimum of 5 hours of independent learning or 7.5 hours per week.

Responsibilities and Assignments:

1. Class attendance, main section (10%): Attendance is very important for a class like this, where information is cumulative and getting behind on the material will have detrimental effects on your performance and grade. Students who attend every class will receive a grade of 100 for class attendance. Students who miss one class will receive a grade of 95. Students who miss two or three classes will receive a grade of 85. Students who miss four classes will receive a grade of 75. Students who miss five classes will receive a grade of 65. Students who miss six or more classes will receive a grade of 50 or below.
2. Class attendance and participation, TA sections (15%): TA sections will involve review, practice, and application of material covered in the main section. Like the main session, attendance is crucial so you don't get behind on the material. In each TA section session, students will complete a basic in-class task/assignment that will be graded as "completed/not completed." Students who attend every TA section and complete the in-class task will receive a grade of 100 for class attendance. Students who miss one TA section will receive a grade of 95. Students who miss two or three sections will receive a grade of 85. Students who miss four sections will receive a grade of 75. Students who miss five sections will receive a grade of 65. Students who miss six or more sections will receive a grade of 50 or below.
3. Data analysis assignments (40%): You will complete five data assignments throughout the semester. These assignments will require you to execute the data analysis skills we cover in the class. You will complete all assignments using R Studio and Quarto. Here are the assignments and due dates (also listed in course schedule). All assignments are due by 11:59pm on the due date.
 - Assignment 1: Data Visualization. Due Monday, Feb. 13
 - Assignment 2: Maps. Due Monday, Feb. 27
 - Assignment 3 Regression. Due Friday, March 10
 - Assignment 4: Regression and Confidence Intervals. Due Monday, Apr. 3
 - Assignment 5: Hypothesis Testing and Inference. Due Monday, Apr. 17
4. Research project (35% total; see breakdown below): Students will complete a final project that poses a research question, posits a hypothesis, and tests that hypothesis using the data analysis skills covered in this class. You will prepare a final paper (due on our designated final exam date) that summarizes all of these aspects. The paper will be like a brief "research note" that is popular in academic journals. It will include your narrative and text and results in the form of graphs and tables. The paper should be approximately 3,000-3,500 words (not including figures and tables). There will be checkpoints on each stage of this project throughout the semester. Another aspect of the final project is the preparation of a brief video presentation that communicates your results. Video presentations will be posted (on a forum such as Flipgrid), and students will be required to provide a brief, written "peer review" of another

student's presentation. Here are the components of the final project. All assignments are due by 11:59pm on the due date.

- Research question (will be part of TA section participation grade): Due Tuesday, March 7
- Hypothesis (will be part of TA section participation grade): Due Tuesday, Apr. 11
- Data and methods of analysis (will count toward Assignment 5): Due Monday, Apr. 17 (as part of Assignment 5)
- Video presentation (10%): Due Thursday, Apr. 27 (last day of class)
- Peer review (5%): Due by our designated final exam date.
- Final paper (20%): Due on our designated final exam date.

Grading Scheme:

93-100%: A	90-92.9: A-	
87-89.9: B+	83-86.9: B	80-82.9: B-
77-79.9: C+	73-76.9: C	70-72.9: C-
67-69.9: D+	60-66.9: D	
<60: F		

Late policy: Any assignment not submitted on time is subject to a letter grade penalty for each day, including Saturday and Sunday, that it is late (i.e., A becomes a B, A- becomes a B-, etc.). A day is defined as beginning at the time an assignment is due. In other words, any assignment turned in within 24 hours of the deadline will be considered 1 day late, any assignment turned in between 24 and 48 hours after the deadline will be considered 2 days late, and so on.

Academic integrity: All assignments are expected to be the work of the submitting student. All reliance on outside sources must be appropriately acknowledged (e.g., quotation marks, footnotes). The failure to acknowledge the ideas, words, and information of outside sources will result in appropriate penalties (e.g., reductions in assignment grades), and could be accompanied by referral to the Office of Student Rights and Responsibilities in accordance with the Code of Academic Integrity.

Course Schedule (I refer to our textbook as “ModernDive”):

1. ** Tues., Jan. 17 (TA Sections): Brief Introduction to Course, Downloading R and R Studio, Basic Functionality (including Quarto)

Thurs., Jan. 19: Introduction to the Course, R, R Studio, and Quarto

- Begin reading ModernDive, Ch. 1

2. ** Tues., Jan. 24 (TA Sections): Getting Started with R

- ModernDive, Ch. 1
- Wickam and Grolemund. *R for Data Science*, Ch. 9, **free** to read online: <https://r4ds.hadley.nz/workflow-scripts.html>

Thurs., Jan. 26: Data Visualization: Describing Variables, Making Comparisons, and Visualizing Relationships

- ModernDive, Ch. 2

3. ** Tues., Jan. 31 (TA Sections): Quarto

- Wickam and Grolemund. *R for Data Science*, Chs. 30-32: <https://r4ds.hadley.nz/quarto.html>

Thurs., Feb. 2: Data Visualization (continued) and Data Wrangling

- ModernDive, Ch. 3

4. Thurs., Feb. 9: Data Importing and “Tidy” Data

- ModernDive, Ch. 4

**** Assignment 1 (Data Visualization) Due Monday, Feb. 13 ****

5. Thurs., Feb. 16: Geographic Visualization: Choropleth Maps in R

- Portions of: Walker, Kyle. *Analyzing US Census Data: Methods, Maps, and Models in R*. CRC Press. Read online for **free**: <https://walker-data.com/census-r/>

6. Thurs., Feb. 23: Basic Regression

- ModernDive, Ch. 5

**** Assignment 2 (Maps) Due Monday, Feb. 27 ****

7. Thurs., March 2: Multiple Regression

- ModernDive, Ch. 6

**** Research Question Due Tuesday, March 7 ****

8. Thurs., March 9: Statistical Theory: Sampling

- ModernDive, Ch. 7

**** Assignment 3 (Regression) Due Fri., March 10 ****

**** No class Thurs., March 16 – Spring Break ****

9. Thurs., March 23: Bootstrapping and Confidence Intervals

- ModernDive, Ch. 8

10. Thurs., March 30: Hypothesis Testing

- ModernDive, Ch. 9

**** Assignment 4 (Regression and Confidence Intervals) Due Mon., Apr. 3 ****

11. Thurs., Apr. 6: Statistical Inference in Regression

- ModernDive, Ch. 10

**** Hypothesis Due Tuesday, Apr. 11 ****

12. Thurs., Apr. 13: Communicating Your Findings

- ModernDive, Ch. 11

**** Assignment 5 (Hypothesis Testing and Inference) Due Mon., Apr. 17. Note: Assignment will include “data and methods of analysis” checkpoint for final project ****

13. Thurs., Apr. 20: Discussion of Final Projects and Presentations

14. Thurs., Apr. 27: Class as office hours. Submit Video Presentations.

- I strongly recommend using our normal class period to do your video presentation.
- I will hold open office hours in our normal classroom to field any questions about the final project.

UNIVERSITY POLICIES

Academic Integrity Code

Academic integrity is an essential part of the educational process, and all members of the GW community take these matters very seriously. As the instructor of record for this course, my role is to provide clear expectations and uphold them in all assessments. Violations of academic integrity occur when students fail to cite research sources properly, engage in unauthorized collaboration, falsify data, and otherwise violate the [Code of Academic Integrity](#). If you have any questions about whether or not particular academic practices or resources are permitted, you should ask me for clarification. If you are reported for an academic integrity violation, you should contact the Office of Student Rights and Responsibilities (SRR) to learn more about your rights and options in the process. Consequences can range from failure of assignment to expulsion from the university and may include a transcript notation. For more information, please refer to the SRR website (<https://studentconduct.gwu.edu/academic-integrity>), email rights@gwu.edu, or call 202-994-6757.

University policy on observance of religious holidays

Students must notify faculty during the first week of the semester in which they are enrolled in the course, or as early as possible, but no later than three weeks prior to the absence, of their intention to be absent from class on their day(s) of religious observance. If the holiday falls within the first three weeks of class, the student must inform faculty in the first week of the semester. For details and policy, see “Religious Holidays” at provost.gwu.edu/policies-procedures-and-guidelines.

Use of Electronic Course Materials and Class Recordings

Students are encouraged to use electronic course materials, including recorded class sessions, for private personal use in connection with their academic program of study. Electronic course materials and recorded class sessions should not be shared or used for non-course related purposes unless express permission has been granted by the instructor. Students who impermissibly share any electronic course materials are subject to discipline under the Student Code of Conduct. Please contact the instructor if you have questions regarding what constitutes permissible or impermissible use of electronic course materials and/or recorded class sessions. Please contact Disability Support Services at disabilitysupport.gwu.edu if you have questions or need assistance in accessing electronic course materials.

Academic support

Writing Center

GW’s Writing Center cultivates confident writers in the University community by facilitating collaborative, critical, and inclusive conversations at all stages of the writing process. Working alongside peer mentors, writers develop strategies to write independently in academic and public settings. Appointments can be booked online at gwu.mywconline.

Academic Commons

Academic Commons provides tutoring and other academic support resources to students in many

courses. Students can schedule virtual one-on-one appointments or attend virtual drop-in sessions. Students may schedule an appointment, review the tutoring schedule, access other academic support resources, or obtain assistance at academiccommons.gwu.edu.

Support for students outside the classroom

Disability Support Services (DSS) 202-994-8250

Any student who may need an accommodation based on the potential impact of a disability should contact Disability Support Services at disabilitysupport.gwu.edu to establish eligibility and to coordinate reasonable accommodations.

Counseling and Psychological Services 202-994-5300

GW's Colonial Health Center offers counseling and psychological services, supporting mental health and personal development by collaborating directly with students to overcome challenges and difficulties that may interfere with academic, emotional, and personal success. healthcenter.gwu.edu/counseling-and-psychological-services.

Safety and Security

- In an emergency: call GWPD 202-994-6111 or 911
 - For situation-specific actions: review the Emergency Response Handbook at: safety.gwu.edu/emergency-response-handbook
 - In an active violence situation: Get Out, Hide Out, or Take Out. See go.gwu.edu/shooterpret
 - Stay informed: safety.gwu.edu/stay-informed