Research Methods and Applied Statistics
PPPA 6002, Sections 11 and 12
Spring 2024
Trachtenberg School of Public Policy and Public Administration
George Washington University

Section 12
Class Meetings: Tuesdays, 3:30 to 5:20 p.m., 1957 E Street (Elliott School), Room 314
Labs: Thursdays, 8:10 to 10 p.m., Rome Hall (801 22nd Street), Room B104

Section 11
Class Meetings: Tuesdays, 6:10 to 8 p.m., Phillips Hall, Room B152
Labs: Tuesdays, 8:10 to 10 p.m., Rome Hall (801 22nd Street), Room B104

Course Staff

Instructor
Professor Christopher Carrigan
(202) 994-5583
ccarrigan@gwu.edu
Office Hours: Mondays and Wednesdays from 4 to 6 p.m. by video chat or phone, as well as by appointment. Sign up at christophercarrigan.youcanbook.me

Teaching Assistant
Natália Tosi
natalia.tosi@gwmail.gwu.edu
Office Hours: During Tuesday and Thursday evening labs as well as by appointment

Overview and Learning Objectives

Having a working knowledge of research methods and statistics is essential for managers and analysts in the public and nonprofit sectors to make thoughtful decisions and evaluate others' recommendations. This course introduces students to the relevant foundational concepts and tools while emphasizing quantitative applications to public policy and public administration decision-making. The primary objective of the course is to provide students with a sound understanding of the research process, research design, and quantitative data analysis.

By the end of the semester, students will be comfortable with many of the key concepts of statistics and be able to read, understand, and conduct basic data analysis. No prior study of research methods and statistics is necessary although some familiarity with computation and algebra is helpful. Through this course, students are exposed to concepts and tools that will allow them to build the skills to be able to:

- Identify the role of statistics in policy debates, public management, and day-to-day life.
- Formulate research questions and testable hypotheses that are used to conduct policy and social science research.
- Implement and evaluate various techniques for sampling from populations.
- Collect data and create datasets for subsequent analysis.
- Evaluate the methodological integrity of experimental and non-experimental research designs.

- Describe, present, and interpret data in visual and numeric forms.
- Apply basic bivariate and multivariate statistical techniques including difference of means and chi square tests as well as regression analysis.
- Conduct statistical analyses using SPSS, a widely used statistical software.
- Prepare a research study that summarizes statistical analyses for a non-technical audience.

Expectations

In this course, you will be required to demonstrate the following three kinds of proficiency: 1) the ability to compute statistics by hand with the aid of a calculator; 2) the ability to manipulate data and compute statistics using SPSS; and 3) the ability to interpret statistical information in both technical and non-technical language. Grades will be determined through a combination of five elements based on the percentages listed in parentheses below.

Class Participation (10%): The class sessions will be more interesting for all of us, and you are certain to learn more if you participate in class. If you need to miss class, be sure to get notes from one of your classmates, as the class discussions will be the best source of material for the tests.

Problem Sets (15%): The problem sets will be graded using a check-plus or check-minus system, based on whether you fully completed the assignment. Thus, your grade on each problem set will be determined not by whether you answered the questions correctly but, rather, whether you completely answered each of the questions and submitted your solutions to Blackboard prior to the beginning of the next class session. This underscores the importance of reviewing my posted solutions after you submit your problem sets to make sure you understand the material. In addition, you are encouraged to work on these assignments with classmates but please turn in your own solutions if you do.

Tests (25% each): There will be two tests given during the course of the semester, one on February 27 and another on April 23. The first will cover course material up to February 27, and the second will focus on course material after February 27. Both will be closed book and will primarily test proficiency of types one and three. However, you will not be required to memorize formulas for either and can bring one page of notes (i.e. one side of one sheet) to the first test and two pages of notes (or one page double-sided) to the second test. Any necessary tables will be provided. In addition, you should plan to bring a calculator to each, but you are not allowed to use the programming function of the calculator if it has one.

Research Paper (25%): This project will provide you with the opportunity to apply what you have learned using a dataset you create to both generate relevant statistics using SPSS and interpret them in technical and non-technical language. The paper will primarily test proficiency of types two and three and should be submitted to Blackboard by 11:59 p.m. on May 7.

Reading Materials

The optional textbook for the course is:

Healey, Joseph F., and Christopher Donoghue. *Statistics: A Tool for Social Research and Data Analysis*. 11th edition. Boston, MA: Cengage, 2021.

This book is not required in the sense that if you feel that the class sessions, problem sets, and notes I provide are sufficient for you to learn the material, you should not feel any pressure to purchase or rent a copy of the book. However, for those of you who would like a textbook to

support your learning, the relevant chapters for each week are listed in the course outline below. The book is available through the GW bookstore.

The course requires you to have access to SPSS. SPSS is installed on the computers in the lab and so is available during the scheduled time. In addition to Rome Hall, computers with SPSS can also be found at the Gelman Library. While it is widely used, SPSS is not necessarily the same software used in more advanced statistics courses at GW such as PPPA 6013. The idea is to expose you to different statistical programs especially given that once you learn the language of one, it is easier to learn the others. As a result, you should not feel that you need to rent or purchase SPSS, as it is available not only on campus but also at no charge through the CCAS Cloud. Still, if you want a copy, it is available for rent through gwu.onthehub.com. I will provide a document that outlines your options for accessing SPSS early in the semester.

Class Schedule, Readings, and Assignments

The schedule outlined below is somewhat tentative. While I will keep us moving forward, I want to make sure we are covering everything that is relevant given that, for many, this will be a first course in research methods and statistics. To the extent that I do make changes, I will be certain to let you know in class. Furthermore, an updated version of the syllabus will always be available on the Blackboard site. Aside from the optional readings from Healey and Donoghue, optional supplementary articles that I assign will be available on Blackboard.

During the allotted lab times, the class TA, Natália Tosi, will hold regular office hours and provide assistance with SPSS to help you with the problem sets and the research paper. Attendance at the lab sessions is encouraged but not mandatory, as you may prefer to teach yourself how to use the software. In some sessions, Natália may also provide instruction on the specific functions of SPSS that are important to completing that week's assignment.

<u>1 – January 16</u>
Topic: Variables and Hypotheses
Readings: Healey and Donoghue (H & D), Prologue and Chapter 1
Chambliss and Schutt (C & S), Chapter 1

<u>2 – January 23</u>
Topic: Measurement and Validity
Readings: C & S, Chapter 4
Due: Problem Set 1

<u>3 – January 30</u>
Topic: Sampling and Data Collection Methods
Readings: C & S, Chapter 9
O'Sullivan, et al., Chapters 6 and 7
Due: Problem Set 2

<u>4 – February 6</u>
Topic: Causal Designs and Internal Validity
Readings: C & S, Chapter 6
Due: Problem Set 3

5 – February 13
Topic: Univariate Descriptive Statistics
Readings: H & D, Chapters 2, 3, and 4
Due: Problem Set 4

6 – February 20
Topic: Normal Curve
Readings: H & D, Chapters 5 and 6
Due: Problem Set 5

February 20 and 24
Test 1 Review Sessions (Optional), 8:10 to 9:40 p.m. and 10 to 11:30 a.m., Phillips B152

7 – February 27
Test 1, 3:30 to 5:50 p.m. or 6:10 to 8:30 p.m.

8 – March 5
Topic: Sampling Distribution, Estimation, and Confidence Intervals
Readings: H & D, Chapter 7

March 12
No Class – Spring Break

9 – March 19
Topic: Hypothesis Testing and Difference of Means
Readings: H & D, Chapters 8 and 9
Due: Problem Set 6

10 – March 26
Topic: Bivariate Correlation and Regression
Readings: H & D, Chapter 13
Due: Problem Set 7

11 – April 2
Topic: Multiple Regression
Readings: H & D, Chapter 15 (except pp. 425-430)
Due: Problem Set 8

12 – April 9
Topic: Contingency Tables and Chi Square Test
Readings: H & D, Chapters 11 and 12 (through p. 331)
Due: Problem Set 9

13 – April 16
Topic: Partial Tables Analysis
Readings: H & D, Chapter 14 (through p. 407)
Due: Problem Set 10

14 – April 23
Test 2, 3:30 to 5:50 p.m. or 6:10 to 8:30 p.m.

April 30
No Class – Make-Up Day

15 – May 7

No Class

Due: Research Paper by 11:59 p.m.

Additional Information and Policies

Submitting Work: Assignments should be submitted through the course Blackboard site by the day and time they are due. Late problem sets will not be accepted, and research papers will be marked down for each day they are late unless I explicitly make an exception based on your extreme circumstances. To submit your work, click on the link to the assignment on Blackboard and upload your Word document or PDF.

Getting Class Help: I encourage you to participate in office hours if you are having difficulty with the course material. To sign up for a specific time, please use the sign up link at christophercarrigan.youcanbook.me. Getting help from either me or the teaching assistant, Natália Tosi, early in the semester might prove useful as many of the weeks build on concepts from prior sessions. For questions about problem sets specifically, Natália is likely your best first source for assistance. In addition to getting help from me and Natália, feel free to sign up for the peer educator program at any point during the semester to work one-on-one with a star student who took the course previously. To learn more about the program, contact our Lead Student Services Specialist, Gregory Nelson, at ganelson@gwu.edu.

General Academic Support: A full range of academic support is offered this spring through Academic Commons at academiccommons.gwu.edu. Although more focused on undergraduates, Academic Commons still offers several short videos as well as a variety of live virtual workshops to equip students with the tools they need to succeed. Through Academic Commons, you can also access the GW Writing Center to make an online appointment. The 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.

Late or Missed Class: I assume that students are absent from class for legitimate reasons (e.g., work, religious holiday, etc.). If you are late or absent from class, it is your responsibility to obtain all announcements, assignments, and handouts from Blackboard or from your classmates.

Test Dates: Please notify me in advance if you are aware of a conflict, such as a religious holiday you observe, that will preclude you from taking either test at the assigned time. To the extent possible, I will certainly try to accommodate your request.

Grade Changes and Incompletes: No changes can be made to grades after the conclusion of the semester, other than in cases of clerical error. To obtain a grade of incomplete, you must consult with me no later than the last day of classes in the semester. At that time, we will both sign a contract for completing the incomplete and submit a copy to the MPP and MPA Program Director. Please consult the latest student handbook on the Trachtenberg School's website for the school policy on incompletes.

Average Minimum Independent Weekly Work: Students will spend approximately three hours per week in class and at the computer lab for 12 weeks. In addition, for the test weeks, students will have two hours and 20 minutes to complete them. Time spent reading optional readings, reviewing video class sessions, completing problem sets and the research paper, and preparing for the tests is expected to amount to, on average, seven hours per week over 15 weeks. During the course of the semester, students will spend close to 41 hours in class and lab sessions and 105 hours preparing for class, for a total of roughly 146 hours.

Academic Honesty: All assignments and projects in this class are to be completed in conformance with the George Washington University Code of Academic Integrity, which can be found at studentconduct.gwu.edu/code-academic-integrity. Cheating and plagiarism will not be tolerated.

Use of Generative Artificial Intelligence (GAI) Tools: GAI tools such as ChatGPT are becoming important resources in many fields and industries. Accordingly, you are permitted to use such tools to generate content submitted for evaluation in this course, including the policy brief and problem sets. While you may use GAI tools to help generate ideas and brainstorm, you should note that the material generated by these tools may be inaccurate, incomplete, or otherwise problematic. Beware that use may also stifle your own independent thinking and creativity. If you include content (e.g., ideas, text, code, images, etc.) that was generated, in whole or in part, by GAI tools in work submitted for evaluation in this course, you must document and credit your source, just like you would any other source. For example, text generated using ChatGPT-4 should include a citation such as: "ChatGPT-4. (YYYY, MM DD of query). 'Text of your query.' Generated using OpenAI. chat.openai.com." Material generated using other tools should be cited accordingly. In addition, even if you do not directly quote material in your work from a GAI tool but use it for other purposes such as generating ideas, still include a footnote in your submission indicating how it was used. Failure to do so in this course constitutes failure to attribute under the George Washington University Code of Academic Integrity.

Use of Electronic Course Materials and Class Recordings: Our class sessions will be recorded and accessible after class through the "GWU Lecture Capture" link on Blackboard. Students are encouraged to use the electronic course materials, including these recorded class sessions, for private personal use in connection with their academic program of study. Electronic course materials and any recorded class sessions should not be shared or used for non-course related purposes unless express permission has been granted by me as the instructor. Students who impermissibly share any electronic course materials are subject to discipline under the Code of Student Conduct, which can be found at studentconduct.gwu.edu/behavioral-conduct. Please contact me if you have questions regarding what constitutes permissible or impermissible use of electronic course materials and/or recorded class sessions. In addition, because our class sessions will be video recorded, as part of this course, you may be recorded. The recordings will only be made available to students enrolled in this class for the duration of the semester and are not allowed to be shared. If you do not wish to be recorded, please contact both me and the GW Privacy Office (privacy@gwu.edu) the first week of class (or as soon as you enroll in the course, whichever is latest) with your privacy concern.

Accommodation for Students with Disabilities: If you need extra time on tests or assignments because of a disability, please let me know as soon as possible. In order to receive accommodations based on a disability, you will need to give notice as well as provide proper documentation to Disability Support Services, Rome Hall, Suite 102, (202) 994-8250.

Classroom Code of Conduct: Higher education works best when it encourages a vigorous and lively exchange of ideas in which all points of view are heard. Free expression in the classroom is an integral part of the process. At the same time, this process is most effective when all approach the enterprise with empathy and respect for others, irrespective of their views or identity. Moreover, it is my intent that students from all backgrounds and perspectives will be well served by this course, that students' learning needs will be addressed both in and out of class, and that the diversity that students bring to this class will be viewed as a resource, strength, and benefit.

GW Support Services: GW and its faculty are committed to creating a safe and open learning environment for all students. If you or someone you know has experienced sexual harassment, including sexual assault, dating or domestic violence, or stalking, please know that help and support are available. You may contact the Title IX Office at (202) 994-7434 or at titleix@gwu.edu. Please be aware that faculty members are required to disclose information about suspected or alleged sexual harassment or other potential violations of the Title IX Sexual Harassment and Related Conduct Policy to the Title IX Office. If you or another student you know wishes to speak to a confidential resource who does not have this reporting responsibility, please contact Counseling and Psychological Services through the Student Health Center at (202) 994-5300, or the Office of Advocacy and Support at (202) 994-0443 or at oas@gwu.edu.

Safety and Security: In the case of an emergency, if at all possible, the class should shelter in place. If the building that the class is in is affected, follow the evacuation procedures for the building. After evacuation, seek shelter at a predetermined rendezvous location.