Research Methods and Applied Statistics
PPPA 6002, Sections 11 and 12
Spring 2017
Trachtenberg School of Public Policy and Public Administration
George Washington University

Section 12
Class Meetings: Tuesdays, 3:30 - 5:20 pm, Duquès Hall (2201 G Street), Room 259
Labs: Tuesdays, 6:10 - 8:00 pm, Rome Hall (801 22nd Street), Room B104

Section 11
Class Meetings: Tuesdays, 6:10 - 8:00 pm, Duquès Hall (2201 G Street), Room 250
Labs: Tuesdays, 8:10 - 10:00 pm, Rome Hall (801 22nd Street), Room B104

Course Staff

Instructor
Professor Christopher Carrigan
MPA Building (805 21st Street NW), 601K
(202) 994-5583
ccarrigan@gwu.edu
Office Hours: Tuesdays from 2:00 - 3:00 pm (MPA 601K) and 5:30 - 6:00 pm (Duquès 259) and
Thursdays from 4:30 - 6:00 pm (phone, Skype, and Blackboard), as well as by appointment.
Please sign up at https://christophercarrigan.youcanbook.me/.

Teaching Assistant
Kerry Belodoff
kbelodoff@gmail.com
Office Hours: During lab 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 problem statements, research questions, and testable hypotheses that are used to conduct policy and social science research.
- Implement and evaluate the various techniques for sampling from populations and collecting data.

- Evaluate the methodological integrity of experimental and non-experimental research designs.
- Describe, present, and interpret data in visual and numeric forms.
- Conduct basic statistical analyses using SPSS, a widely-used statistical software.
- Write a policy research report that summarizes the results of a statistical analysis 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 hand-held 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%): Please come to class and come prepared by reading the materials assigned in advance. The class sessions will be more interesting to both of us, and you are certain to learn more if you prepare. If you do 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 exams.

Homework Assignments (10%): There will be ten homework assignments over the course of the semester, of which the top nine will be counted in computing your final grade. Thus, you can choose to skip one assignment, or if you decide to turn in all ten, the one with the lowest grade will be dropped. The homework assignments will require proficiency of all three types and will be graded on a check-plus, check, and check-minus system. To the extent you find it useful, you should feel free to work on these assignments with classmates. However, if you do decide to work with other students, you must still turn in your own solutions and list the names of those individuals at the top of your homework. Responses should be submitted via the course Blackboard site which is located at http://blackboard.gwu.edu prior to the beginning of class.

Midterm Exam (25%): The midterm will be a closed book exam given during class on February 28 and will cover all course material up to that point. It will primarily test proficiency of types one and three. However, you will not be required to memorize formulas and can bring one page of notes (i.e. one side of one sheet). The necessary tables will be provided. You should plan to bring a calculator to the exam, but you are not allowed to use the programming function of the calculator if it has one.

Final Report (25%): The final report will provide you with the opportunity to apply what you have learned using a dataset you create to generate relevant statistics and interpret them in both technical and non-technical language. A hardcopy of your report is due at the beginning of class on April 25. Additional details will be provided after the midterm.

Final Exam (30%): The final will also be a closed book exam and is tentatively scheduled for May 9. Like the midterm, the final exam will test proficiency of types one and three. You can bring two pages of notes (or one page double-sided) and a calculator, again without using its associated programming function. You will be provided with any necessary tables. The exam will cover all of the course material but will place a relative emphasis on the information discussed after the midterm.

Reading Materials

The textbook for the course is:
Healey, Joseph F. *Statistics: A Tool for Social Research*. 9th ed. Belmont, CA: Wadsworth, 2012.

The book is available at the GW bookstore, and no supplemental materials are needed. You are also welcome to use the 10th edition. However, if you do, it is your responsibility to make sure you are both covering the same material when reading and answering the correct problems given that the book will be used as a source for some of the homework problems.

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, SPSS can also be found in the computer labs at the Gelman Library and the Hall of Government. While it is widely-used, SPSS is not necessarily the same software used in the more advanced statistics courses at GW such as PPPA 6013. The idea is to expose you to different types of software especially given that once you learn the language of one, it is easier to learn the language of the others. As a result, you should not feel that you need to purchase the software. Still, if you do decide you want a copy of SPSS for your computer, it is available at the bookstore.

Class Schedule, Readings, and Assignments

The schedule as 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. Moreover, I may change some of the readings as we go. 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 readings from Healey, the supplementary articles that I assign will be available on Blackboard as well.

During the allotted lab time, the class TA, Kerry Belodoff, will hold regular office hours and provide assistance with SPSS to help you with the homework assignment. Attendance at the lab sessions is encouraged but not mandatory as you may prefer to teach yourself how to use the software. In many of these sessions, Kerry will also provide instruction on the specific functions of SPSS that are important to completing that week's assignment.

1 – January 17
    Topic: Variables and Hypotheses
    Readings: Healey, Prologue and Chapter 1
            Chambliss and Schutt (C & S), Chapter 1

2 – January 24
    Topic: Measurement, Sampling, and External Validity
    Readings: C & S, Chapters 4 and 5
    Due: Homework 1

3 – January 31
    Topic: Data Collection Methods
    Readings: C & S, Chapter 9
            O'Sullivan, et al., Chapters 6 and 7
    Due: Homework 2

4 – February 7
    Topic: Causal Designs and Internal Validity
    Readings: C & S, Chapter 6
    Due: Homework 3

5 – February 14
    Topic: Univariate Descriptive Statistics
    Readings: Healey, Chapters 2, 3, and 4
    Due: Homework 4

6 – February 21
    Topic: Normal Curve, Sampling Distribution
    Readings: Healey, Chapters 5 and 6
    Due: Homework 5

7 – February 28
    Midterm Exam
    Hand Out Final Report Assignment

8 – March 7
    Topic: Estimation
    Readings: Healey, Chapter 7

March 14
    No Class – Spring Break

9 – March 21
    Topic: Hypothesis Testing and Difference of Means
    Readings: Healey, Chapters 8 and 9
    Due: Homework 6

10 – March 28
Topic: Contingency Tables and Chi Square Test
    Readings: Healey, Chapter 11
    Due: Homework 7

11 – April 4
    Topic: Bivariate Correlation and Regression
    Readings: Healey, Chapters 12 (through p. 317) and 14
    Due: Homework 8

12 – April 11
    Topic: Multiple Regression
    Readings: Healey, Chapter 16
    Due: Homework 9

13 – April 18
    Topic: Partial Tables Analysis
    Readings: Healey, Chapter 15 (except pp. 418-420)
    Due: Homework 10

14 – April 25
    Topic: Final Exam Review
    Due: Final Report

<u>15 – TBD but Likely May 9</u>
Final Exam
Note: The date, time, and location for the final exam are tentative pending confirmation sometime in March.

Additional Information and Policies

<u>Getting Help:</u> I encourage you to come to office hours to ask questions if you are having difficulty with the course material. To sign up for a specific time, please use the link https://christophercarrigan.youcanbook.me/. Getting help from me and/or the teaching assistant, Kerry Belodoff, early in the semester might prove useful as many of the weeks build on concepts from prior sessions. For questions about homework assignments specifically, Kerry is likely your best first source for assistance.

<u>Submitting Work:</u> Assignments should be turned in by the beginning of class on the date they are due. Homeworks should be submitted via the course Blackboard site, and final projects should be handed in at the start of class or left in my mailbox prior to the deadline. Late homework assignments will not be accepted, and final reports will be marked down for each day they are late unless I explicitly make an exception based on your extreme circumstances.

<u>Average Minimum Independent Weekly Work:</u> Over 15 weeks, students will spend approximately three hours per week in class and at the computer lab, except for the midterm and final exam weeks where students will have two hours and 30 minutes to complete the exams. Required readings, problem sets, and the policy brief are expected to take, on average, seven hours per week. Over the course of the semester, students will spend roughly 44 hours in class and at the lab and 105 hours preparing for class, for a total of 149 hours.

<u>Late or Missed Class:</u> 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 your classmates.

<u>Exam Dates:</u> 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 the midterm or the final at the assigned time. To the extent possible, I will certainly try to accommodate your request.

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

<u>Grade Changes and Incompletes:</u> 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 school director. Please consult the latest TSPPPA student handbook on our website for the school policy on incompletes.

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