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SOCIAL SCIENCE RESEARCH METHODS
Government 300 - 003 (CRN: 20543)
George Mason University
Tuesdays & Thursdays, 3:00pm – 4:15pm
Lecture Hall 1
Spring 2018

Professor:	**Jennifer Nicoll Victor, Ph.D.**
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Office:	Research Hall 343
Office Hours:	Tuesdays & Thursdays 11:00am – 12:00pm, or by appointment
Course Website:	Available for enrolled students at http://blackboard.gmu.edu
Schar School Main Office:	Research Hall 359

Teaching Assistant:	**Erica Seng-White**
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TA Office:	Graduate Student carrels, accessed via Research Hall 359
TA Office Hours:	Tuesdays & Thursdays 12:00 – 2:00pm

All students in this course are required to be enrolled in one of the following laboratory sections, led by the TA:
Section1: Fridays, 10:30 – 11:45am, Innovation Hall 223
Section2: Wednesdays, 4:30 – 5:20pm. Innovation Hall 327

I. Course Description

This course provides an introduction to social scientific research methods with applications to government and politics. The course is designed to introduce students to the theory, procedures, and methodologies associated with statistical inference and causal reasoning. Based on the scientific method, students will learn how to organize, conduct, document, and report a scientific study on questions related to government or politics. Students will learn how to process and analyze data using the R statistical programming language. In addition to learning how to operate the software, students will learn how to manipulate and describe data, test univariate and multivariate hypotheses, and develop graphical visualizations of data and findings.

II. Course Objectives

I have two broad objectives for this course. First, students will master the foundations of sound social scientific research design. Second, students will become comfortable using the R statistical language to manage and analyze data. The combination of these skills will lead to greater confidence in conducting investigations on questions of interest in government, policy, and political science. I additionally hope this confidence feeds students' curiosity about the world and their ability to make contributions to important social and political problems.

III. Course Structure

The class meets three times per week. All students will attend two lectures, conducted by Professor Victor. Additionally, each student will enroll in one weekly laboratory section. There are two options of lab sections in the schedule. Students are required to attend at least one per week. The sections will be led by the teaching assistant and conducted in a classroom computer laboratory. The primary activity in the lab section will be learning how to use the software and gaining practice with the techniques.

IV. Teaching Philosophy and Teaching Style

My teaching philosophy is based on three primary principles.

- First, I believe the gap between undergraduate and graduate coursework in political science is too broad. I therefore introduce advanced theoretical concepts in undergraduate classes so that students understand the true value of studying politics as a science; moreover, should any student choose to pursue advanced or graduate work in political science, they will be well prepared.

- Second, I believe in incorporating current events into classroom lessons. Nothing in science seems concrete until one can "see it with their own eyes." Reading a daily newspaper and following current events, then applying theoretical concepts to political happenings helps to clarify theoretical concepts and demonstrate their utility.

- Third, as learning a programming language is challenging and can be frustrating. I aim to help students develop workflow habits that can ease the frustrations and provide guidance in meeting the challenge of learning this software. The modern world demands today's graduates have transportable technical skills and I want those who complete this course to have added to these skills and have great confidence in your ability to continue to add to such skills beyond the course.

- Finally, as an instructor and a leader of class discussions on everything from lawmaking to elections, I aim to remain politically neutral and non-partisan. Students should learn to collect and evaluate information on their own. I would not want students who disagree with my political views to hear all course information with a skeptical ear; nor would I want students who tend to agree with my views to accept everything I say at face value. I encourage students to express their views, be critical, and challenge information when it is appropriate.

My teaching style is consistent with my philosophy. I use a Socratic-style in the classroom in which I frequently ask questions and encourage an interactive learning experience. I do my best to learn students' names, encourage participation, and create, what I hope is, an open learning environment where students feel free to question, comment, and explain how they view course content. Such an environment helps to foster student interaction, thinking, and analytical and creative skills. Moreover, while lectures are important because they help to

distribute necessary information and facts, they are not usually the most effective way to learn information. For this reason, we will do a variety of activities in the classroom. Successful performance in this course will include classroom participation and working in and out of class with your peers.

V. Student Responsibilities

A. Class Attendance and Participation. Learning is an *active*, rather than *passive*, exercise. Accordingly, every student is expected to attend class as well as be prepared to ask questions about and comment on the readings. You need to complete the daily reading assignment *prior* to the class meeting. You will be much more successful in this class if you attend regularly, take notes, pay attention, and participate.

B. Readings. As is the case with attendance, keeping pace with the reading is essential to succeeding in this class. It is *your* responsibility to obtain copies of the readings prior to the date we will discuss them in class. I will do everything I can to make this task easier for you. You will be much more successful in this course if you complete the assigned readings and **take notes** on them.

C. Technology **The use of laptop computers, tablets (such as iPads), and smart phones is prohibited in class,** except when instructed to do so. The costs associated with electronic distractions, to you and those around you, outweigh the benefits of immediate supplementary classroom information. Students may use specific instructional applications, such as *Blackboard*, only when instructed to do so. However, students may not use laptops or other devices on a general basis in this class. If these restrictions pose a challenge for you, please discuss it with me. For more information on the benefits of taking notes by hand, see this.

D. Cheating, Plagiarism, and Academic Integrity. Students in this course will be expected to comply with the George Mason University Honor Code (see http://honorcode.gmu.edu/). There are three simple guidelines to follow with respect to academic integrity: (1) all work you submit must be your own; (2) when using the work or ideas of others, including fellow students, give full credit through accurate citations; and (3) if you are uncertain about the expectations for any assignment, ask for clarification. Any student engaged in any academic misconduct *will receive an F on the offending exam or assignment.* Egregious violations will result in an F grade for the course and will be reported to the appropriate Dean's office. These violations include cheating on an exam, using someone else's work as your own, and plagiarizing the written word. Plagiarism (using someone else's words or ideas without providing credit or citation) is a serious offense. *If you have any questions at all about what constitutes cheating, plagiarism, or academic misconduct, please ask the instructor.*

E. Students with Disabilities. If you have a disability for which you are or may be requesting an accommodation, please let me (the instructor) know and contact the Office of Disability Services (ODS) at (703) 993-2474 or *http://ods.gmu.edu*. All discussions with me regarding disabilities are confidential.

VI. Course Requirements and Graded Evaluation

There are four graded requirements for this course, described below. Grades will be calculated on a non-curved typical A-F scale where,

93-100	A	87-89	B+	77-79	C+	67-69	D+	< 60	F
90-92	A-	83-86	B	73-76	C	63-66	D		
		80-82	B-	70-72	C-	60-62	D-		

Daily Quizzes (10%) At the end of each lecture, students will be required to take a short quiz on Blackboard. The quiz will be open-book/open-note and not time restricted. Students may repeat quizzes for a higher score, if they choose. Each student's three lowest quiz scores will be excluded from the course grade.

Homework sets and programming activities (20%) Homework sets will be distributed, collected, and evaluated by your teaching assistant. These may be electronic or, occasionally, hand written. There will be 5 homework sets, and a series of programming exercises to be completed on-line (see below). Some of the programming activites are graded components and others are optional.

Midterm Exam (20%) There will be an in-class, midterm examination. The exam will be closed book and closed note. The exam is on **Tuesday, March 27.**

Research Paper (25%). All students will write a research paper on a topic selected from a list of provided research questions. Final products will be 8 – 12 pages (excluding titles, bibliography, tables, graphs, notes). The paper will highlight the following skills: motivating a research question, stating a research question, reviewing literature on a question, developing testable hypotheses, describing the data, describing the statistical test, reporting the findings. In their papers, students are expected to showcase skills learned in class. The assignment will be scaffolded in the following way.

Step 1: Paper introduction (state and motivate the research question; 1-2 paragraphs) (**DUE: Feb. 20**) 5%
Step 2: Annotated bibliography (6-12 sources) (**DUE: March 1**) 5%
Step 3: Literature Review, Theory, and hypotheses (2-4 pages) (**Due: March 20**) 10%
Step 4: Research design (2-3 pages) (**Due: April 5**) 10%
Step 5: Empirical test and findings (2-3 pages) (**DUE: April 19**) 20%
Step 6: Complete draft (8-12 pages) (**DUE: May 1**). 50%

Final Exam (25%) There will be an in-class, comprehensive final examination. The exam will be closed book and closed note. The exam is on **Thursday, May 10, 1:30pm – 4:15pm.**

VII. Policies on late work, make-ups and extra credit

A. *Can I submit an assignment late?* Students may submit an assignment after its due date for a 5% (off the total possible score) penalty per-24-hour period that the assignment is late.

B. *What if I miss an exam?* Make-up exams are only given in the case of verified illness or family emergency, such as a death in the family. Documentation is necessary to receive a qualified make-up examination. Students who arrive late to an in-class exam may still sit for the exam if no other student has already submitted their exam; once a single student hands-in their exam, no others may begin the exam.

C. *What can I do if I perform poorly on an assignment?* Students who receive a 72% or less on a homework assignment or essay (not exam) may re-do the assignment for a replacement grade. Re-do assignments are subject to a 5% per day penalty starting from the day graded assignments were returned to students in class (regardless of attendance). Assignments that were originally submitted past the due date are NOT eligible for re-do.

VIII. Texts

The reading assignments are chosen to buttress and expand on the analytic foundation laid in class. **Please notify the instructor about problems obtaining the readings as soon as possible**. The following materials are required and can be found at the campus bookstore.

Required Readings

Pollock, III, Phillip H. 2016. *The Essentials of Political Analysis*. 5th ed. Sage CQ Press.

Pollock, III, Philip H., and Barry C. Edwards. 2017. An R Companion to Political Analysis. 2nd ed. CQ Press.

Recommended Reading

Grolemund, Garrett, and Hadley Wickham. n.d. *R for Data Science*. Accessed January 16, 2018. http://r4ds.had.co.nz/.

Kellstedt, Paul M., and Guy D. Whitten. 2013. *The Fundamentals of Political Science Research*. 2 edition. Cambridge: Cambridge University Press.

Monogan, III, James E. 2015. *Political Analysis Using R*. 1st ed. 2015 edition. New York, NY: Springer.

IX. Software

We will use the R statistical programming language to learn how to manipulate and analyze data. To operate R we will use R-Studio, a user-interface that makes R a bit nicer to operate. In addition we will rely on several on-line resources to help us learn R, including DataCamp. Links for downloading, installing, and learning about these resources appear below.

Resource Name [1]	Availability	Description
R	https://www.r-project.org	Free, open-source, statistical programming language. Download R from the "Comprehensive R Archive Nework" (CRAN) from any mirror of your choice.
R-Studio	https://www.rstudio.com	A user interface that operates "on top" of R and makes it friendlier to use.
DataCamp	https://www.datacamp.com/	This is a website designed for learning programming and statistical analyses. You will receive an email invitation to join the DataCamp group that is set up for the class. DataCamp will include assignments and activities to be completed on your own, and sometimes in your class laboratory section, that will contribute toward your course grade. There may be opportunities to earn extra credit by doing extra DataCamp assignments.
Swirl*	http://swirlstats.com/	This is a package that students can use in R to help learn how to use R. Doing Swirl exercises will teach you the commands and syntax necessary to operate the software and complete assignments. I will recommend Swirl lessons that will complement the curriculum but completing them will be optional and unmonitored.

[1] Resources marked with * are not required, but they are recommended resources. Unmarked resources are considered required for the course.

Resource Name [1]	Availability	Description
R for Data Science*	Wickham, Hadley, and Garrett Grolemund. 2017. *R for Data Science*. O'Reilly. http://r4ds.had.co.nz/. http://r4ds.had.co.nz/transform.html	This is a free on-line textbook that is very helpful for learning R, looking up commands, and getting advice. Please use it as a reference
R Bloggers*	https://www.r-bloggers.com/	This website is a wealth of resources, example code, and helpful users who can help troubleshoot problems.
StackOverflow*	https://stackoverflow.com/	A user's help website where people post questions and other users will answer them. Search their archives to find help with all sorts of coding puzzles.
Quick-R*	https://www.statmethods.net/index.html	Another resource for learning R, getting help, instructions, example help, etc.

I. Course Schedule and Reading Assignments

The summary below provides a list of the electronic lessons we'll do in DataCamp and Swirl. Programming activities in ***bold italics*** are required components of your grade (those in plain text are optional).

In **DataCamp** we'll do the following courses:

1. ***Introduction to R ---------- (due 2/13)***
2. R for the intimidated---------- (available until 3/1)
3. Intermediate R ---------- (available until 3/1)
4. ***Cleaning Data ---------- (due 3/2)***
5. Data manipulation with dplyr ---------- (available until 5/15)
6. ***Data visualization in R ---------- (due 4/6)***
7. Data visualization with ggplot2 ---------- (available until 5/15)
8. *Exploratory Data Analysis ---------- (available until 5/15)*
9. ***Correlation and Regression ---------- (due 5/4)***

In **Swirl** we'll do the following courses:

1. R Programming – Basic Building Blocks
2. R Programming – Workspace and Files
3. R Programming – Sequence of Numbers
4. Data Analysis – Data Visualization
5. Data Analysis – Central Tendency
6. Data Analysis – Dispersion
7. R Programming – Vectors
8. R Programming – Missing Values
9. R Programming – Subsetting Vectors
10. R Programming – Matrices and Data Frames
11. Statistical Inference
12. Regression Models

Date	Topics	Readings	Assignments and Activities[2]
Week 1 T., Jan. 23	Course Introduction - Workflow - Motivations	None	***1. Download and install R & R-Studio*** ***2. Accept DataCamp (DC) invitation; create profile***
Week 1 Th., Jan. 25	Studying Politics Scientifically	Pollock, Introduction Pollock, Ch. 10 (pp. 244-247) Noel, Hans. 2010 "Ten Things Political Scientists Know that You Don't"	***1. Daily Quiz 1*** ***2. Daily Quiz 2*** ***3. Installpackages: 'poliscidata' & 'swirl'***
Week 2 T., Jan. 30	Introduction to R	Edwards & Pollock (E&P), Ch. 1	***1. Daily Quiz 3*** 2. Swirl: 1 – 3 ***3. Begin DC 1***

[2] Assignments and activities in ***bold italic*** face are required graded components. Others are non-graded, recommended activities.

Date	Topics	Readings	Assignments and Activities[2]
Week 2: Th., Feb. 1	Generating research questions; conceptualizations	Pollock, Ch. 1 (pp. 1-9)	
Week 3 T., Feb. 6	Measurement theory, error; reliability & validity	Pollock, Ch. 1 (pp. 9-23)	***1. Daily Quiz 4*** ***2. Complete BB module on research ethics*** 3. Download and install Zotero
Week 3 Th., Feb. 8	Research Ethics	"History of Research Ethics | Research and Economic Development | University of Nevada, Las Vegas." n.d. Accessed January 18, 2018. https://www.unlv.edu/research/ORI-HSR/history-ethics. "Ethical Codes & Research Standards." 2016. Text. HHS.Gov. February 19, 2016. https://www.hhs.gov/ohrp/international/ethical-codes-and-research-standards/index.html.	
Week 4 T., Feb. 13	Literature reviews	Knopf, Jeffrey W. 2006. "Doing a Literature Review." *PS: Political Science & Politics* 39 (01):127–132. http://journals.cambridge.org/abstract_S1049096506060264	***1. Daily Quiz 5*** ***2. Daily Quiz 6*** ***3. Homework set #1 due in lab*** ***4. DC 1 due 2/16 midnight*** 5. Swirl 4 6. Begin DC 4
Week 4 Th., Feb. 15	Data visualization	Pollock, Ch. 3 (pp. 63-70) "7 Visualizations You Should Learn in R." 2016. *R*-	

Date	Topics	Readings	Assignments and Activities[2]
		Bloggers (blog). December 29, 2016. https://www.r-bloggers.com/7-visualizations-you-should-learn-in-r/. Wickham, Hadley, and Garrett Grolemund. 2017. *R for Data Science*. O'Reilly. http://r4ds.had.co.nz/, Ch. 3 "Data Visualization" Machlis, Sharon. 2017. "Beginner's Guide to R: Painless Data Visualization." Computerworld. August 18, 2017. https://www.computerworld.com/article/2497304/business-intelligence/business-intelligence-beginner-s-guide-to-r-painless-data-visualization.html.	
Week 5 T., Feb. 20	Unit of analysis; types of data	Pollock, Ch. 2 (pp. 24-47)	***1. Paper Intro due 2/20*** ***2. Daily Quiz 7*** ***3. Daily Quiz 8*** 4. Swirl 5, 7-9
Week 5 Th., Feb. 22	Descriptive statistics	E&P, Ch. 2, Descriptive Statistics	
Week 6 T., Feb. 27	Creating hypothesis	Pollock, Ch. 3 (pp. 48-58) E&P, Ch. 3, Transforming Variables	***1. Paper bibliography due 3/1*** ***2. Daily Quiz 9*** ***3. Daily Quiz 10*** ***4. Homework set #2 due in lab*** 5. ***DC 4 due 3/2 midnight*** 6. Swirl 6
Week 6 Th., Mar. 1	Making comparisons in tables	Pollock, Ch. 3 (pp. 58-63) E&P, Ch. 4, Making Comparisons	
Week 7 T., Mar. 6	Research designs &	Pollock, Ch. 4 (pp. 78-101)	***1. Daily Quiz 11*** ***2. Daily Quiz 12***

Date	Topics	Readings	Assignments and Activities[2]
	causal inference		3. Swirl 10 4. Begin DC 6
Week 7 Th., Mar. 8	Controlled Comparisons	Pollock, Ch. 5 (pp. 102-122) E&P, Ch. 5, Making Controlled Comparisons	
Week 8 T., Mar 13 & Th. Mar 15	Spring Break		
Week 9 T., Mar. 20	Populations and samples; central limit theorem	Pollock, Ch. 6 (pp. 123-145)	**1. Literature review due 3/20** ***2. Daily Quiz 13*** ***3. Daily Quiz 14*** ***4. Homework set #3 due in lab***
Week 9 Th., Mar 22	Inference; t-tests	Pollock, Ch. 6 (pp. 136-156) E&P, Ch. 6, Making Inferences about Sample Means	
Week 10 T., Mar 27	Midterm Exam		
Week 10 Th., Mar 29	Tests of significance	Pollock, Ch. 7 (pp. 156-170)	***1. Daily Quiz 15***
Week 11 T., Apr 3	Tests of significance	E&P, Ch. 7, Chi-Square	**1. Paper Research Design due 4/5**
Week 11 Th., Apr 5	Association	Pollock, Ch. 7 (pp.170-182)	***2. Daily Quiz 16*** ***3. Daily Quiz 17*** ***4. DC 6 due 4/6 midnight*** 5. Swirl 11
Week 12 T., Apr 10 & Th., Apr 12	Correlation & Linear regression	Pollock, Ch. 8 (pp. 183-194) E&P, Ch. 8 Correlation and Linear Regression	***1. Daily Quiz 18*** ***2. Daily Quiz 19*** ***3. Homework set #4 due in lab*** 4. Begin DC 9
Week 13 T., Apr 17 & Th., Apr 19	Regression extensions	Pollock, Ch. 8 (pp. 194-201) E&P, Ch. 9	**1. Paper test and findings due 4/19** ***2. Daily Quiz 20*** ***3. Daily Quiz 21*** 4. Swirl 12
Week 14 T., Apr 24	Multiple regression	Pollock, Ch. 8 (pp. 201-214)	***1. Daily Quiz 22*** ***2. Daily Quiz 23***

Date	**Topics**	**Readings**	Assignments and Activities[2]
& Th., Apr 26			***3. Homework set #5 due in lab***
Week 15 T., May 1 & Th., May 3	Maximum Likelihood Estimation	Pollock, Ch. 9 (pp. 215-243) E&P, Ch. 10	***1. Paper final draft due 5/1*** ***2. Daily Quiz 24*** ***3. Daily Quiz 25*** ***4. DC 9 due 5/4 midnight***