

Quantitative Political Analysis II

COURSE INFORMATION	<i>Term:</i> Fall 2019 <i>Level:</i> Intermediate <i>Meet:</i> M/W 11-12:20 (Class) M 8:30-10 (Lab) <i>Room:</i> ACE 329 <i>Syllabus Revision:</i> November 4, 2019	<i>Instructor:</i> Jack Reilly <i>Office:</i> Social Sciences 205 <i>E-mail:</i> jreilly@ncf.edu <i>Office Hours:</i> M 12:30-1:30 and by appt <i>Appointments:</i> jackltreilly.com/appointments
DESCRIPTION	This course is intended for all students who intend to conduct quantitative research in political science, and will also be useful for other social science students interested in quantitative analysis. It will introduce students to the scientific norms of the study of political science, research design, and the fundamental problem of statistical inference. Major goals for the course include the introduction and use of major political and social science datasets, including the American National Election Studies, the General Social Survey, the Cooperative Congressional Election Study, and others, as well as the practical use of advanced statistical techniques to analyze these datasets.	
COURSE STRUCTURE	This will be the most applied stats course you will ever take. We have two main components to the class: a theoretical track, introducing relevant statistical techniques and methods, and an applied track, in which we learn about writing code for statistical analysis software (Stata), conduct analyses, and replicate previous studies.	
PREREQUISITE	An introductory class in statistics (Quantitative Political Analysis I, Introduction to Statistics, Dealing with Data I, Introduction to Biostatistics, etc). Students should already be familiar with the concept of hypothesis testing and bivariate regression to take the class. This course is recommended for students who intend to take Econometrics in the spring. Upper-division work in a social science is highly recommended before taking the course.	

Books and Software

BOOKS	Required <ul style="list-style-type: none">• Lewis-Beck and Lewis-Beck, 2015. Applied Regression: An Introduction, Second Edition. Sage Green Book #22.• Tufte, 1974. Data Analysis for Politics and Policy. (ebook: http://www.edwardtufte.com/tufte/ebooks)• Accock, 2016. A Gentle Introduction to Stata (Any edition fourth or newer should do) Recommended <ul style="list-style-type: none">• Long, 2009. Workflow of Data Analysis Using Stata. Stata Press.• Berry, 1985. Multiple Regression in Practice. Sage Green Book #50.
SOFTWARE	A primary component of the class is learning how to effectively and practically use statistical software. The main software package we will use, Stata, is the standard package used by practicing political scientists, and is very common in sociology and economics as well. It is also

frequently used by political think tanks, policy analysts, financial analysts, businesses, and statistical consultants. New College has licenses available for use in NCF computer classrooms as well as the computers in the Quantitative Social Science Lab (ACE 228), the ARC, HNS 108, and the Bon House Lab.

If you want to use Stata on your personal computer, you can purchase Stata as either a temporary six-month license or a perpetual license. If you wish to do this, please talk to me before purchasing to make sure you buy the right version (in short: do not buy small Stata"). New College has also made Stata available for student use through the virtual desktop client (vdi.ncf.edu), which you can access from your own computer anywhere with an internet connection.

Course Requirements

OVERVIEW

Satisfactory completion of the course requires completion of the following:

1. Daily Reading & Preparation
2. Assignments
 - (a) Technical
 - i. Problem Sets
 - ii. Replications
 - (b) Interpretive
 - i. Class Summaries (in 200 words or less)
 - ii. Assignment Summaries
3. Exams
 - (a) In-class exams (2)
 - (b) Take-home exams (2)
4. Final Project
 - (a) Pre-Registration Papers
 - (b) Final Presentation
 - (c) Peer Review & Discussant Duties
 - (d) Final Research Paper

ASSIGNMENTS

There are two kinds of assignments in this class: generic problem sets, testing statistical know-how and abilities, and replications, which require you to come as close as you can to replicating an existing piece of analysis (to be assigned by the professor). For each kind of assignment, you will be evaluated not only on whether your answers are mathematically correct, but also on coding style and the clarity of your presentation of statistical results.

All assignments are due on the Wednesday of each class week, at the beginning of class, electronically. As we will go over assignments in class the day they are due, late assignments will not count for credit. Assignments are due to me canvas.

EXAMS	<p>There are two exams in this class. The course is cumulative, and each exam will be comprehensive. These exam dates will not change: please write them down in your calendar now to make sure conflicts do not arise.</p> <p>The first exam is on October 7, 2019. The second exam is on November 13, 2019. Take-home exams will be distributed at the conclusion of each exam and are due two days later.</p>
FINAL PROJECT	<p>You will be required to conduct an original research project using an existing social science dataset and present it to the class. Presentations will take place during the last two weeks of class (potentially including finals week), and papers will be due at the end of exam week: December 13, 2019.</p>

Course Expectations

ETIQUETTE	<p>Course participants must be courteous to the professor and fellow students. Attend class on time, listen to fellow students when they talk, disagree (or agree) with others' arguments professionally. Cell phones should be silent and kept out of sight, computers should be used only for educational purposes: no text messaging, Internet browsing, facebook-ing, tweeting, etc.</p>
OFFICE HOURS	<p>I encourage you to stop by my office hours at any point if you have questions about the course, the readings, school, etc. In addition to formal office hours, I have an open-door policy: if the door is open, you are welcome to come in. If you want to be sure you can speak with me, setting up an appointment beforehand at jacklreilly.youcanbook.me is always a good idea.</p>
E-MAIL	<p>Students can generally expect a response to all e-mails within 24 hours, excepting weekends. I'm happy to answer any questions over e-mail that require less than a paragraph in response. Questions that require more than a short paragraph in response should be addressed in person.</p>
A NOTE ON WRITING	<p>Clear writing and argumentation is a critical element to success in this class. I strongly recommend exploring the options for writing (and revising!) assistance at the Writing Resource Center. You can schedule an appointment through the writing center here: https://ncf.mywconline.com</p>
NEW COLLEGE POLICY STATEMENTS	<p>Students with Disabilities: Any student who, because of a documented disability, may require special arrangements and/or accommodations, should contact the instructor as soon as possible to make necessary arrangements. Students must present appropriate verification from Student Disability Services during the instructor's office hours. Please note that instructors are NOT permitted to provide classroom accommodations to a student until appropriate verification from Student Disability Services has been provided. For additional information, please visit Student Disability Services in HCL 3 and/or email disabilityservices@ncf.edu.</p> <p>Religious Observance: No student shall be compelled to attend class or sit for an examination at a day or time when s/he would normally be engaged in religious observance or on a day or time prohibited by his or her religious belief. Students are expected to notify their instructors if they intend to be absent for a class or announced examination, in accordance with the policy, prior to the scheduled meeting.</p> <p>Academic Integrity: Any suspected instance of plagiarism will be handled in accordance with the College's policy on academic dishonesty.</p>

Class Schedule

OVERVIEW

There are two main tracks to the course. The first track, statistics, will cover topics related to the linear regression model. This includes some or all of the central limit theorem, hypothesis testing, bivariate regression, multiple regression, regression with categorical independent variables, interactive effects, multicollinearity, nonspherical errors, and an introduction to regression with categorical dependent variables (the generalized linear model.) The second track, the workflow of data analysis, focuses on the practical components of statistical analysis. Topics include replication, coding and writing style, debugging, annotation, automation, presentation, graphics, data cleaning, storage, and management. Generally speaking, we will cover material from the first track on Mondays and material from the second on Wednesdays.

TOPICS OUTLINE Readings in *italics* are located on the course Google drive.

W	Main	Workflow	Reading	Work Due
1	Diagnostic Quiz	Measurement & CLM Review	<i>Kellstedt & Whitten, ch 7, Tufte, ch 1, Acock 1-3</i>	Diagnostic Quiz
2	LABOR DAY	Introduction to Stata and Coding Style	<i>Kellstedt & Whitten, ch 8, Tufte, ch 2, Acock ch 4</i>	Assignment 0
3	Univariate and Bivariate Inference	Replicability, Cleaning & Recoding Data	Tufte, ch 3, Lewis-Beck2, chs 1 & 2, Acock ch 8	Assignment 1: Stata Basics
4	Multiple Regression	Surveys, Choosing Variables	Tufte, ch 4, Lewis-Beck2, ch 3, Acock ch 10	Assignment 2: Regression
5	Categorical Independent Variables	Graphics and Visualization I (Univariate)	Acock, ch 5, <i>Jacoby, ch 1-2</i>	Assignment 3: More Regression
6	Categorical Interactions	Replication	Acock, ch 6, Lewis-Beck2, ch 4	Assignment 4: Replication 1
7	Exam I: Basics	Catch-up	<i>Jaccard & Turrisi, chs 1-2</i>	Exam
B	FALL BREAK			
8	Continuous Interactions	Predicted Values & Marginal Effects Plots	<i>Berry & Feldman, ch 5; Long, ch 4; Jacoby, Ch 3</i>	Assignment 5: Replication 2
9	Transformations	More Marginal Effects Plots	<i>Berry & Feldman, ch 4</i>	Assignment 6: Interactions
10	Outliers & Nonspherical Errors	Graphics and Visualization II (Bivariate)	<i>Research for final paper</i>	Pre-Registration Assignment 1
11	VETERAN'S DAY	Exam II: Extensions	<i>Review</i>	Exam
12	Logistic Regression	Reproducibility, Preparing Data, Weights, Loops	<i>Pollock, Logistic Regression; Acock, ch 11</i>	Assignment 7: Replication 3
13	Ordinal & Multinomial Logistic Regression	resenting Your Work, Catch-up	<i>Research for final paper</i>	Pre-Registration Assignment 2
14		<i>Presentations</i>		Presentations
F	FINAL WEEK			Final Paper, Bonus Assignments

Additional Resources

- Introductory Statistics
 - Kellstedt and Whitten, 2013. The Fundamentals of Political Science Research. Cambridge.
 - Wheelan, 2014. Naked Statistics.
 - Gonick and Smith, 1993. The Cartoon Guide to Statistics.

- Lewis-Beck, 1995. Data Analysis: An Introduction. Sage Green Book #103.
- Jaccard and Turrisi, 2003. Interaction Effects in Multiple Regression. Sage Green Book #72.
- Aldrich, 1984. Linear Probability, Logit, and Probit Models. Sage Green Book #45.
- Agresti and Finlay, 2008. Statistical Methods for the Social Sciences. Pearson.
- Huff and Gels, 1993. How to Lie with Statistics.
- Pampel, 2000. Logistic Regression: A Primer. Sage Green Book #132.
- Fox, 1991. Regression Diagnostics Sage Green Book #70
- <http://students.brown.edu/seeing-theory/>
- <http://www.reed.edu/psychology/stata/index.html>
- More Advanced Statistics
 - Fox, 2015. Applied Regression Analysis and Generalized Linear Models. (also the R companion)
 - Long, 1997. Regression Models for Categorical and Limited Dependent Variables. Sage.
 - Long and Freese, 2014. Regression Models for Categorical Dependent Variables Using Stata, 3rd Edition. Stata Press.
 - Shalizi, 2015. Advanced Data Analysis from an Elementary Point of View. Online.
 - McElreath, 2015. Statistical Rethinking.
 - Gelman and Hill, 2006. Data Analysis Using Regression and Multilevel/Hierarchical Models.
 - Monogan, 20xx. Political Analysis Using R.
 - James et al. 2017. An Introduction to Statistical Learning.
- Graphics
 - Healy and Moody, 2014. “Data Visualization in Sociology”. *Annual Review of Sociology*.
 - Healy, 2018. Data Visualization: An Introduction. <https://socviz.co>
 - Tufte, 2001. The Visual Display of Quantitative Information, 2nd ed.
- Workflow & Data Management
 - Bowers, 2011. “Six Steps to a Better Relationship With Your Future Self” *The Political Methodologist*.
 - Healy, 2018. The Plain Person’s Guide to Plain Text Social Science. <http://plain-text.co/>