PS218: Understanding Political Numbers
Spring 2016
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About the Course:
Formally, this course will teach you how to understand quantitative analysis, how to develop a data-based research question that you can answer, how to collect and analyze the data and how to present your conclusions to others.
There are essentially two components to the course. The first is the theoretical component. Why are numbers and data important to political analysis? What is the proper way to ask a research question? How do we find and use political data to tell a story and support an argument? The second component is technical. How do we employ statistical computing and graphics software to clearly present our data and findings to others?
Yet, in essence, this course is about more than just numbers. It is a skills and tools course. It is about learning how to ask (and answer) the right questions about politics. It is about presenting those answers clearly to an audience. And, it is about employing the computing tools to help get to this end goal. In so doing, it is about getting and “A” on every term paper you write from here on out.
Computing Requirements:
You need to have a computer you can use and on which you can install R and R Studio. Both are free and can be run on either Windows and Mac operating systems. They are available for download at www.r-project.org and www.rstudio.com respectively. R is a free, open source statistical computing environment. R is extremely powerful and flexible. It is at the cutting edge of statistical software and it is the best producer of statistical graphics available. RStudio is an Integrated Development Environment (IDE) for R that combines a text editor, R, and other tools in a single program. We recognize that R and RStudio take time to master and can be frustrating. That is why we'll spend so much time during the course learning it. We DO NOT assume any prior knowledge of statistics or R. While we do expect some knowledge of basic computing tasks (creating folders, etc.), this course is designed to provide you all the necessary instruction in the programs you will be using.

Text:
There is no required text for this course. In general, the lectures are self-contained and will allow students to succeed in the course. I understand that for some the lack of a text to follow along with and for those students there are a number of “additional resources” that I can recommend here for anyone who prefers a text. The following are “manuals” of sorts to help you learn R and R Studio. 
R Graphs Cookbook by Hrishi V. Mittal. The best basic text on creating basic graphics in R. 
Visualize This by Nathan Yau This course draws significantly on Yau’s ideas about data visualization. 
Additionally, websites such as flowingdata.com, fivethirtyeight.com, and nytimes.com/upshot are excellent examples of data analysis
and visualization.
Any substantive reading for the course will come in the form of short articles, book chapters and online readings. These will be posted on Learn@UW and/or sent to you via e-mail. Lectures, R Script files and other course related material will also be posted on Learn@UW throughout the semester.

There are a number of other texts and websites that I can recommend for the more advanced user. If you find yourself in this category, just ask.

**Components of the Grade:**
First, we will have a number of exercises designed to demonstrate you've learned the basic skills of programming in R. These will be brief, with the goal that you learn how to read data, or make a chart, or conduct an analysis. You will submit your R code and output but generally won’t have to write much beyond that. These will be graded as 1 (satisfactory), .5 (turned in but incorrect or incomplete) and 0 (not turned in). Because we will be discussing solutions to these exercises in class the day they are due, late work WILL NOT be accepted.
Second, you will submit two more in depth analyses of topics that we cover in class. This will be in the form of short essays and several accompanying graphics that illustrate your analysis, created using R. The goal here is to develop your ability to “tell a story with data”, the fundamental objective of the class. These will be graded on the conventional A-F scale.
At the end of the semester, you will write a final paper, similar to the above but longer (12 pages, excluding graphics) and with more detailed analysis. For this project you will choose the subject and be responsible for collecting the data. This essay will also graded on an A-F scale.
Since this is the most important component of your grade for the course, we will ask you to submit 2 “drafts” in the final weeks of the
semester. The first will be a short (2-3 pages) paper proposal in which you identify your research question and plan for your paper. The second will be the submission of the data and codebook that you will use in the analysis section of your final paper. In addition to developing this paper you will also present your memo/proposal to the members of your discussion section in no more than 7 minutes. You will develop a presentation that relies on quantitative information and graphics. Each section will choose the best project from their section to advance to the finals. Finalists will present their projects to the entire class at the last class meeting. Section presentations begin April 21, with sign up online the week before.

The winning presentation, as determined by a ballot of the class and the instructors, will earn an A for the course. All of the finalists are guaranteed at least an AB in the course. All members of the section from which the winning presentation is taken get 2 percentage points added to their final course grade (you must be present for voting to receive this extra credit).

***All assignments must be submitted online via the Dropbox section of the Learn@UW site. All documents should be submitted in .pdf format. All assignments involving computer coding should also include the .R script that generates all your output as a separate file.

All sources for data and other information used in your written work must be appropriately documented and sourced such that we can go and confirm every statement and number in the document. There will be NO final exam.

**Grading:**
Your final grade will be computed based on Exercises 20% 2 short essays 20% 2 paper “drafts” 20% Final paper 40% The standard UW Grading Scale will be used.

**A Note on Attendance:**
A number of sessions of this course will be conducted in more of a workshop format as opposed to a traditional lecture. Learning R is like learning a new language; it takes lots of hands on practice. As such, attendance is extraordinarily important. While I won’t often take formal attendance, it is my experience that it is extraordinarily difficult to pass this course without regularly showing up. Additionally, since a large component of this course involves computing, it is perfectly acceptable to use laptops during lecture. That said, if your laptop is open I expect you to be working in R Studio not your social media accounts.

***Students affiliated with the McBurney Center should see me about any necessary accommodations.***
Course Outline
Below you will find the tentative outline for the semester. Be aware that these topics and dates are subject to change. This is especially important since we will take this course at your pace (i.e. if we need to spend more time on certain skills, we will). As such, consult Learn@UW, your e-mail and/or in class announcements for up to date changes.

Week 1
Wednesday, January 20—Intro and Syllabus

Week 2
Monday, January 25—Thinking about Political Numbers
   Readings--Intro from The Signal and the Noise by Silver and Ch. 1&2 from Visualize This by Yau
   Wednesday, January 27—Thinking About Data Visualization

Week 3
Monday, February 1—Introduction to R and R Studio
   Wednesday, February 3—Elections and Numbers
      Online readings regarding 2012 Presidential Election

Week 4
Monday, February 8—Histograms in R
   **Exercise 1 distributed**
   Wednesday, February 10—More on Histograms, Bar and Box Plots in R

Week 5
Monday, February 15—World Health Data
   Reading---The Healing of America by Reid, Ch. 1&3
   Wednesday, February 17—Scatter Plots in R
**Exercise 1 due**

Week 6
Monday, February 22 — More on Scatter Plots

**Exercise 2 distributed**
Wednesday, February 24 — Basic linear trend lines in R

Week 7
Monday, February 29 — Alabama Election and Plotting Linear Models
Readings — Articles on Alabama and Wisconsin Gubernatorial Elections

**Exercise 3 distributed**
Wednesday, March 2 — Data Collection and Management in R and Excel

**Exercise 2 due**

Week 8
Monday, March 7 — Interpreting Linear Models and p-values
Wednesday, March 9 — Non-Linear Relationships (Quadratic and Logarithmic)

**Exercise 3 due**
**Essay 1 distributed**

Week 9
Monday, March 14 — What are Good Research Questions??
Wednesday, March 16 — Discuss Paper Topics

**Essay 1 Due**

SPRING BREAK

Week 10
Monday, March 28 — Basic Multivariate Linear Models in R
Wednesday, March 30 — More with Basic Multivariate Models and Forecasting
   Readings — Articles on Forecasting Elections
   **Essay 2 distributed**

Week 11
Monday, April 4 — Where do I find data??
Wednesday, April 6 — Plotting Data Over Time in R
   **Paper Proposal due Friday 4/8 by 5pm**

Week 12
Monday, April 11 — Black Death and Presidential Approval (More Time Series)
   **Essay 2 due**
Wednesday, April 13 — Writing your paper...a full outline of what we expect
   **Data Set and Codebook due Sunday 4/17 by 5pm**

Week 13
Monday, April 18 — Advanced topics in R and Visualization—the Challenger
Wednesday, April 20 — Advanced topics in R and Visualization
   **Presentations in Section Begin Thursday 4/21**

Week 14
Monday, April 25 — Advanced topics in R and Visualization
Wednesday, April 27 — Political Numbers in the News

Week 15
Monday, May 2 — The Future of Political Numbers
Wednesday, May 4 — Final Paper Presentations

Friday, May 13 — **Final Paper Due** 11:59pm