PADP7120-26207: Data Applications in Public Administration

Department of Public Administration & Policy
School of Public & International Affairs
The University of Georgia

Fall 2019: Thursdays @ 3:30pm – 6:15pm
Caldwell 306

Instructor: Alex Combs, Ph.D.
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Office Hours: Wednesdays 1:00pm – 5:00pm
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Course Overview

This course introduces graduate students of public administration and policy to key concepts in data applications, emphasizing both statistical theory and software skills necessary to understand, conduct, and communicate quantitative analysis.

This course is organized into three broad sections:

1. Fundamental statistical concepts, data description, and visualization.

2. Regression: The workhorse of predictive and explanatory statistical analysis.

3. Inference: How sample statistics are used to explain facts & events in a population.

Learning Objectives

Student progress on learning objectives will be assessed via in-class labs, problem sets, and exams. Upon successful completion of this course, students should be able to:

1. Identify and resolve issues often encountered during quantitative analysis.

2. Identify the appropriate methodological tools for analysis.

3. Analyze and interpret data using the methodologies covered in the course.

4. Produce data analysis to effectively inform the public and other stakeholders.

Course Materials

All texts and software for this course are open source or available to you through UGA.

Texts

1. Grolemund, Garrett, and Wickham, Hadley. 2017. R for Data Science. O'Reilly. https://r4ds.had.co.nz. Denoted as **G&H** in the Course Schedule.

2. Ismay, Chester, and Kim, Albert Y. 2019. Statistical Inference via Data Science. https://moderndive.com. Denoted as **I&K** in the Course Schedule.

3. Healy, Kieran. 2018. Data Visualization: A practical introduction. Princeton University Press. http://socviz.co/index.html#preface.

4. Diez, David M., Christopher D. Barr, and Mine Çetinkaya-Ründel. 2016. OpenIntro Statistics. 3rd Eds. https://www.openintro.org/stat/index.php?stat_book=os.

5. Monogan III, James E. 2015. Political Analysis Using R. Springer. Available for download via UGA Libraries.

Software

1. R https://cran.r-project.org/
   - R is the program that executes computational commands.

2. RStudio https://www.rstudio.com
   - RStudio is a user-interface for R. **Install R before installing RStudio.**

3. Excel will be used sparingly. It should be available on UGA computers.

Other potentially helpful texts

1. Lower-level statistics review: https://www.openintro.org/stat/index.php?stat_book=aps.

2. Ismay, Chester. 2018. Getting Used to R, RStudio, and RMarkdown. https://rbasics.netlify.com/index.html

Additional readings from other sources will be distributed in class or online.

Assignments & Grading

Course grades are determined by performance on the following assignments:

- In-Class Labs – 10%

- 5 Problem Sets – 50%

- Midterm Exam – 20%

- Final Exam – 20%

In-Class Labs

- About half of our meetings will include an in-class lab to practice covered concepts.

- Labs are graded as complete/incomplete. If you attend class and work on a lab, then you receive full credit.

Problem Sets

- Problem sets include a combination of conceptual and applied questions. Applied questions require students to execute statistical operations using R.

- Up to 3 students may work together on a problem set.

- Students should submit their answers to problem sets as well as their R script.

Exams

- Both midterm and final exams will be distributed online.

- You are free to use notes, texts, and any other resources.

- They will be timed but generously so.

- Both will include questions that cover concepts and require analysis in R.

Course & University Policies

Instructor Availability

If you would like to speak with me outside of class, feel free to stop by my office during scheduled office hours. If you need to meet outside of office hours, please email me at least 24 hours in advance to set a specific time.

Class Attendance/Participation

Students are highly encouraged to participate through asking questions and answering inquiries raised in class. The readings are curated to help you prepare for class, practice work relevant to assignments, and inspire questions. You are highly encouraged to complete the readings. Not all assigned readings may be discussed or used in class.

Special Needs and Academic Honesty

Students with special needs that require accommodation should notify the Office for Disability Services and me as soon as possible so the appropriate arrangements can be made. All information as well as documentation is considered confidential. All academic work must meet the standards contained in A Culture of Honesty. Students are responsible for informing themselves about those standards before performing any academic work. The link to more detailed information about academic honesty can be found at: http://www.uga.edu/honesty/ahpd/culture_honesty.htm.

Miscellaneous

No extra credit will be assigned in this course under any circumstances. Keep in mind that final grades may only be changed in the event of a clerical error (e.g., points summed incorrectly). Also, for privacy reasons, information pertaining to course grades cannot be discussed over the telephone or via email. A final grade of Incomplete will only be given in this course under extraordinary circumstances and is solely at the discretion of the instructor. The course syllabus is a general plan for the course; deviations announced to the class by the instructor may be necessary. Please silence devices while in class. I accept late work after the due date only by prior arrangement.

PADP 7120 Fall 2019 Course Schedule

(Updated August 23, 2019)

Week	Topics	Readings	Assignments
1 (8.15)	Course Overview Introduction to Statistics Intro to R & Workflow	G&H Ch. 1, 4, 6, 8 I&K Ch. 1.1, 2 Adams et al. 2013 via eLC	PS#1 assigned
2 (8.22)	Variable Types Data Structures Measurement Validity & Reliability Intro to Data Viz	Diez Ch. 1.2 I&K Ch. 3 G&H Ch. 3.1-3.3	PS#1 due PS#2 assigned
3 (8.29)	Data Import in R Data Wrangling in R Tidy Data	G&H Ch. 5, 12	
4 (9.5)	Data Description	Diez Ch 1.6, 1.7	
5 (9.12)	Data Viz for Communication and Best Practices	Healy Ch. 1 G&H Ch. 28	PS#2 due PS#3 assigned
6 (9.19)	Simple Linear Regression Multiple Regression	I&K Ch. 5 Diez Ch. 7-7.2	
7 (9.26)	Assessing Regression Model Fit Categorical Variables	I&K Ch. 6 G&H Ch. 15	
8 (10.3)	Nonlinear Regression		PS#3 due
9 (10.10)	Midterm Exam - No Class		
10 (10.17)	Estimation and Inference Joining Data in R	I&K Ch. 7, 8 G&H Ch. 13	PS#4 assigned
11 (10.24)	Hypothesis Testing Regression Inference	I&K Ch. 9, 10	
12 (10.31)	Regression Assumptions Regression Diagnostics	Kabacoff Ch. 8	
13 (11.7)	Causation & Bias Working with Strings in R	Pearl Ch. 1 G&H Ch. 14	PS#4 due
14 (11.14)	Intro to Time Series & Forecasting Working with Dates & Times in R	G&H Ch. 16	PS#5 assigned
15 (11.21)	Intro to Panel Data Analysis Other Variants of Regression		
16 (11.28)	Thanksgiving Break – No Class		
17 (12.5)	Reading Day – No Class		PS#5 due
18 (12.10) 3:30- 6:30pm	Final Exams Week		