

PADP 7120: Data Applications

University of Georgia
Spring 2022
Thursday, 7:00-9:50 PM, Baldwin 307
Professor Anastasopoulos

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Office Hours: Tu, Th 2-3 PM

Course Overview and Objectives

This course is an introduction to statistical reasoning and thinking applied to understanding the policy world. The tools that we will learn in this course will help you not foster a better understanding of policy problems more broadly, but will help clarify the way that you think and reason through problems where data is involved. The topics that we will cover include: research design, measurement, causal inference and understanding how we measure and interpret relationships between events and concepts.

Required Text and Readings

The required text for the course:

Textbook: We will use an open source statistics book—you can download a free pdf copy here:
<https://www.openintro.org/book/os/>

Diez, David M., Christopher D. Barr, and Mine Çetinkaya-Ründel. 2016. *OpenIntro Statistics*. 4th Eds.
www.openintro.org. (A hard copy can be purchased on Amazon for \$25 or less.). Referred to in the syllabus as *DBR*.

There will also be additional readings available on the course webpage.

Grading

Your course grade will be calculated as follows:

Attendance and Participation 10%
Problem Sets 30%
Group project 20%
Midterm exam 20%
Final Exam 20%

Letter Grade	Score (% Correct)
A	90-100%
A-	88-89%
B+	84-87%
B	80-83%
B-	78-79%
C+	74-77%
C	67-73%
D	60-66
F	59 and below

Attendance is mandatory and class participation and class discussion is an essential part of this class.

R Labs

Throughout the semester, we will devote about 15-30 minutes of class time each week to getting acquainted with the statistical package **R**. During these labs, I will introduce a programming topic and then ask you to complete a short assignment in breakout groups of 3 or fewer students.

In preparation for the **R** Labs, please download and install:

- 1) The latest version of **R**: <https://cloud.r-project.org/>
- 2) The latest version of **RStudio**: <https://www.rstudio.com/products/rstudio/download/>.

Problem Sets

Your final grade will be based on weekly problem sets with assignments provided one week before the due date. These assignments will be taken from the required text. They must be turned in on time and late assignments will receive a grade of zero in the absence of a university-approved excuse.

Midterm Exam

There will be an in class midterm on **Thursday, February 24th**. The midterm will be about ½ multiple choice and ½ short answer questions. You will need a simple calculator that can do addition, multiplication and division for both the midterm and the final. The midterm will include pieces of R code that you will be asked to interpret as well. You may also be asked to write R code for the midterm

Final Exam

There will be an in class final exam on **May 11 from 7:00-10:00**. The final will be about ½ multiple choice and ½ short answer questions. You will need a simple calculator that can do addition, multiplication and division for both the midterm and the final. The midterm will include pieces of R code that you will be asked to interpret as well. You may also be asked to write R code for the midterm

Group Research Project

The group research project will require you to work in groups of 2-4 on one of a few pre-selected topics that I will provide to you after the Midterm. Groups may also choose their own topic but you must consult with me beforehand if you decide to pursue your own topic.

The group research project will require you to apply the methods that you will learn in the class to a policy problem. There are two main deliverables for the project:

1. A 5-10 page report.
2. A 5-7 minute presentation on your findings.

You will be required to present your findings to the class and submit your reports on **Thursday, April 28th (THIS IS OUR LAST DAY OF CLASS)** There is more detailed information about the group project here: **TBA**.

Group Project Proposal

On **March 10th**, you will be asked to submit a final group project proposal for me to review. The final group project proposal will be a 1-2 paragraph document with the following information:

1. The topic that you are proposing to work on.
2. The position that you plan to take.
3. Data/evidence that you will use to support your argument.

Key Dates

- **February 24th**: In class midterm.
- **March 10th**: Final group project proposal due.
- **April 28th**: Group research projects and presentations due.

Course Calendar*

Week	Date	Topic	Reading	HW Due	R Tutorial (recommended)	R Lab (in class & HWs)
1	01/13	Data Concepts	Ch. 1	--	--	--
2	01/20	Summarizing Data	Ch. 2	HW 1	Intro to Data	Intro to R/RStudio
3	01/27	Probability I	Ch. 3.1-3.2 Only	HW 2	Exploratory Data Analysis	Intro to Data
4	02/03	Probability II	Ch. 3.4-3.5	HW 3		
5	02/10	The Normal Distribution	Ch. 4.1 only	HW 3		The Normal Distribution
6	02/17	Foundations for Inference I: Confidence Intervals	Ch. 5.1-5.2 only	HW 4	Sampling Variability	Sampling Distributions
7	02/24	Foundations for Inference II: Hypothesis Testing	Ch 5.3	No HW Due In Class Midterm	Hypothesis Testing	
8	03/03	Inference for Categorical Data	Ch. 6.1-6.2 only	HW 5	Parameters and Confidence Intervals	Confidence Intervals
Spring Break	03/10	Try to relax!				
9	03/17	Inference for numerical data	Ch 7.1-7.3 only	Group project proposals due		Inference for Categorical Data
10	03/24	Intro to Linear Regression I	Ch. 8.1-8.2 only	HW 6	Visualizing two Variables Correlation	Inference for Numerical Data
11	03/31	Intro to Linear Regression II	Ch 8.3-8.4 only	HW 7	Simple Linear Regression Interpreting regression models. Model Fit	Simple Linear Regression
12	04/07	Multiple linear	Ch 9.1-9.2	HW 8		

		regression	only			
13	04/14	Multiple regression diagnostics	Ch. 9.3-9.4	HW 9	Multiple Linear Regression	Multiple Linear Regression
14	04/21	Logistic regression	Ch. 9.5	HW 10	Logistic Regression	Logistic Regression
14	04/28	Class Presentations	No reading	HW 11		

*I reserve the right to change the calendar to ensure that we spend enough time on each topic. If changes become necessary, they will be announced in class.

Statement about Students with Disabilities

Students with special needs that require accommodation should notify me and the Office for Disability Services in the first two weeks of the course so appropriate arrangements can be made. All information and documentation of special needs is confidential.

Statement about Plagiarism and Academic Dishonesty

Students are responsible for maintaining the highest standards of honesty and integrity in every phase of their academic careers. The penalties for academic dishonesty are severe and ignorance of the policy is not an acceptable defense. See also <https://ovpi.uga.edu/academic-honesty>.