

PADP 8120: Data Analysis and Statistics (Fall 2013)

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Course Information

Classroom: Candler 214

Class Time: Thurs., 3:30–6:15pm

Course Description

This course provides students an opportunity to develop quantitative analysis skills that can be applied to social science research questions. We will discuss the methods used to collect quantitative evidence and to analyze quantitative data. Topics will include sampling, descriptive statistics, probability distributions, confidence intervals, hypothesis testing, comparison of means, ordinary least squares, dealing with violations of the underlying assumptions of multiple regression, and dichotomous choice models. I will also provide an introduction to the R software for statistical analysis.

By the end of the course, students should be able to:

- Identify and propose questions of analysis that are pertinent to contemporary social science research.
- Identify the most appropriate methodological techniques for analysis given a research question and available data, as well as identify and offer resolution to various problems encountered during quantitative analysis.
- Conduct data analyses using the methodologies covered in the course.
- Manage data and conduct analyses using the R statistical software package.

Required Materials

Statistical Methods for the Social Sciences by Alan Agresti and Barbara Finlay, 4th edition.

Additionally, you will need access to R. There are two ways to obtain it:

1. Download it at the Comprehensive R Network (CRAN) webpage: <http://cran.us.r-project.org/>.
2. Use it at the computer lab in Baldwin Hall.

You may want to install a Graphical User Interface (GUI) for R. If so, I recommend RStudio, available for free at <http://www.rstudio.com/>.

Finally, there are several useful R books available on the class website, some of which will have sections assigned during the course.

Grading

Class attendance is not required, though there is little prospect of success without it.

Two Exams

There will be an in-class midterm on **October 10** and a take-home final exam handed out on **November 21**, which is due on **November 27 at 11:59PM**. The final exam is cumulative. Each exam counts for 30% of the course grade. Any known scheduling problems should be brought to my attention as soon as possible. If you miss the midterm exam without a university-approved excuse, you will receive a zero. If you have a university-approved absence, then the final exam will count for 60% of the course grade. No make-up exam will be given. A one-page formula sheet will be provided for the midterm exam and the take-home final exam is open book.

Weekly Homework Assignments

There will be weekly homework assignments, which will count for 10% of the course grade. These will be graded on a 3 point scale (check plus, check and check minus). No late assignments will be accepted, but your lowest grade will be dropped.

Group Presentation of a Paper

This presentation will count for 10% of the course grade. Choose a group of 3-4 people. I will assign each group a published journal article to read, interpret, and summarize. On **November 14**, each group will present the following about their assigned paper: the research question, the data used, the empirical methodology, and the findings. The presentation will include an interpretation of the findings and how these results answer the original research question. The grade for the group presentation will be based on three things:

1. My evaluation of the group (all group members receive same grade)
2. Students' evaluations of the group (all group members receive same grade)
3. Group members' evaluation of each student

Original Research Paper

This paper will count for 20% of the course grade. Conduct empirical research on the question of your choice using a dataset of your choice. A research proposal that includes the dataset, the research question and details about the key variables of interest is due on **September 12**. The research paper is due on **November 21**. This paper will include a brief introduction to the research question, a description of the data and measures, including descriptive statistics, an explanation of the empirical methodology, results, and the discussion/interpretation of the results. No literature review is necessary. The question does not need to be vigorously motivated with the literature or interpreted in the context of other findings in the literature.

Course Topics

Note: The course syllabus is a general plan for the course; deviations announced to the class by the instructor may be necessary. We may not cover all of these topics. Conversely, time permitting, other topics might be covered in this course.

August 15: Introduction and Overview; Introduction to Random Sampling

- Chapters 1 and 2

August 22: Describing Data

- Chapter 3

August 29: NO CLASS

- Annual Meeting of the American Political Science Association, Chicago, Illinois

September 5: Probability Distributions

- Chapter 4

September 12: Confidence Intervals

- Chapter 5
- Research proposal due

September 19: Significance Tests

- Chapter 6

September 26: Comparing Groups

- Chapter 7

October 3: Associations between Categorical Variables

- Chapter 8

October 10: MIDTERM EXAM

October 17: Ordinary Least Squares (Univariate)

- Chapter 9

October 24: Ordinary Least Squares (Multivariate)

- Chapters 10 and 11

October 31: Underlying Assumption Problems

- Chapter 14

November 7: Models for Dichotomous Dependent Variables

- Chapter 15

November 14: Group Presentations

November 21: Review

- Research paper due
- Final Exam handed out

November 27: FINAL EXAM DUE VIA EMAIL BY 11:59 PM