

## QUANTITATIVE METHODS

**Instructor:** Dr. Lance Freeman

**Teaching Assistant:** Elizabeth Marcello

**Class Time:** Thursdays 11:00-1:00 p.m.

**Class Room:** 200 N Buell

**Lab time:** Thursday 2:00-4:00 p.m.

**Lab room:** 200 Fayerweather

**Office Hours:** Tuesdays 2:30-4:30 p.m. or by appointment

**Office:** 304 Buell Hall

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Course website: <https://courseworks.columbia.edu/welcome/> (Log in and this course should be displayed on the screen).

### Course Objectives

The purpose of this class is to introduce students to the concepts, techniques and reasoning skills necessary to understand and undertake quantitative research. By the end of the semester students will be able to:

Design a quantitative research proposal

Conceptualize a quantitative statistical model

Estimate a quantitative statistical model

Interpret the results of descriptive analyses, t-tests, chi-square and multivariate regression analyses.

Conduct statistical power analysis.

Students will learn and hone their skills through a combination of attending weekly class meetings, participating in weekly labs, completing written assignments and writing a research paper that tests a hypothesis using quantitative techniques.

## Texts

Below are texts that we will use for the course. The books can be purchased from the Columbia University bookstore.

Schmuller, Joseph. 2017. *Statistical Analysis with R*. Hoboken: John Wiley & Sons.

Meier, Kenneth J., Jeffrey L. Brudney, and John Bohte. *Applied Statistics for Public and Nonprofit Administration*, 9<sup>th</sup> edition. Boston: Wadsworth

Berry, William D. and Stanley Feldman. *Multiple Regression in Practice*. Newbury Park: Sage Publications.

Menard, Scott. *Applied Logistic Regression Analysis*. Newbury Park: Sage Publications.

Reinhart, Alex. *Statistics Done Wrong: The Woefully Complete Guide*. No Starch Press.

## Course Schedule

Meeting	Topic	Readings	R Readings	Assignments Due
1. 9/6	Conceptualizing quantitative research	<i>Applied Statistics</i> Chapters 3		
2. 9/13	Probability	<i>Applied Statistics</i> Chapter 7, 8		Assignment 1
3. 9/20	Inference	<i>Applied Statistics</i> Chapters 10; <i>Statistics done Wrong</i> , Chapter 1	pp. 111-112	Assignment 2
4. 9/27	Inference continued	<i>Applied Statistics</i> Chapters 11, 12	pp.187-200	Assignment 3
5. 10/4	Inference continued	<i>Applied Statistics</i> Chapter 13	pp.205-226	Assignment 4

6. 10/11	Statistical Power	<i>Applied Statistics</i> Chapter 11 pp. 195-197, Chapter 12 pp. 207-209; <i>Statistics done Wrong</i> , Chapter 2	pp. 174-182	Assignment 5
7. 10/18	Introduction to Regression: Bivariate Regression	<i>Applied Statistics</i> Chapter 17	pp.277-294	Assignment 6 SELECT DATA FOR FINAL PROJECT
8. 10/25	Midterm			
9. 11/1	Regression: Multiple Regression	<i>Applied Statistics</i> Chapter 20	pp.295-298	Assignment 7
10. 11/8	Regression: Multiple Regression	<i>Multiple Regression in Practice</i> Chapters 1-4	pp.295-298	Research Proposal Due (Read chapters, 7,8 and 9 in <i>Statistics Done Wrong</i> )
11. 11/15	Regression: Multiple Regression	<i>Multiple Regression in Practice</i> Chapters 5 & 6	pp.335-358	Assignment 8
12. 11/29	Regression: Multiple Regression extensions	<i>Applied Logistic Regression Analysis</i> Chapters 1 & 2		Assignment 9
13. 12/6	Regression: Multiple	<i>Applied Logistic Regression</i>		Assignment 10

	Regression extensions	<i>Analysis</i> Chapters 3 & 4	
<b>14. 12/13</b>	No Class		<b>Final Paper Due (Read chapters 5 and 6 in <i>Statistics Done Wrong</i>)</b>

### Grading

Homework:	60%
Midterm:	20%
Final Paper	20%

**Note: Homework assignments are due 11:00 a.m. on the day of class. All assignments must be uploaded to Courseworks. Late assignments will not be accepted.**

## Course Summary:

<b>Date</b>	<b>Details</b>
Thu Sep 13, 2018	Assignment 1 due by 11am
Thu Sep 20, 2018	Assignment 2 due by 11am
Sun Sep 30, 2018	Assignment 3 due by 11:59pm
Thu Oct 4, 2018	Assignment 4 due by 11:00am

<b>Date</b>	<b>Details</b>	
Thu Oct 11, 2018	Assignment 5	due by 11:00am
Thu Nov 8, 2018	Assignment 7	due by 11:00am
	Final Paper Proposal	due by 11:00am
Thu Nov 15, 2018	Assignment 8	due by 11:00am
Thu Nov 29, 2018	Assignment 9	due by 11am
Thu Dec 13, 2018	Assignment 10	due by 11am
Mon Dec 17, 2018	Final Paper	due by 5pm
	Assignment 6	
	Midterm Grade & Comments	