

# Quantitative Methods II, Psych 5067

*Spring 2018*

## People

**Instructor:** Joshua Jackson

**Office:** 315B

**Office hours:** 10-11 Wednesday and by appointment

**TA:** Shelly Cooper **Office:**

**Office hours:**

TBA

## Course Description

This course will provide a detailed overview of multiple regression as a data-analytic method. The course provides a conceptual background of the central ideas and applications along with the necessary applied skills to carry out analyses of continuous and categorical data. The analytic approaches are thus applicable to experimental research in which factors are manipulated and to observational research. Goals are threefold: (1) learn how to look at and think about data – to check for problems in regression models, errors in computer outputs, identify missuses of regression, (2) be able to examine the relationship among regression models, theoretical models, and your data, and (3) construct regression equations to examine specific hypotheses and interpret resulting models and regression coefficients.

## Class textbook

- Learning Statistics with R by Daniel Navarro <https://health.adelaide.edu.au/psychology/ccs/teaching/lsr/>

*Recommended text (not required)*

-Aiken, L. S., & West, S. G. (1991). Multiple regression: Testing and interpreting interactions. Newbury Park, CA: Sage Publications.

-Cohen, J., Cohen, P., West, S. G., & Aiken, L. A. (2003). Applied multiple regression/correlation analysis for the behavioral sciences (3rd edition). Hillsdale, NJ: Lawrence Erlbaum Associates.

-Cumming, G. (2013). Understanding the new statistics: Effect sizes, confidence intervals, and meta-analysis. Routledge.

-Myers, J.L., Well, A. D., & Lorch, R. F. (2010). Research Design & Statistical Analysis (3rd Ed.), New York, NY: Routledge.

-McElreath, R. (2016). Statistical Rethinking: A Bayesian Course with Examples in R. CRC Press.

## Grading

The class consists of 2 in class tests, a cumulative final exam, 7 “take home” projects, and one oral “exam”. The 2 in class exams make up 40% of your grade (20% each). The final exam will account for 20%. The 7 take home projects fulfill 35% of your final grade (5% each) while the oral exam will make up the remaining 5%.

Typically, grades are “curved,” but not curved to a predefined distribution. The curve will always be in a manner that will help people, not hurt.

Due dates for exams and other project details will be listed on the announcements/home page. Expect exact dates to change throughout the semester so be sure to check the site frequently.

Note: take home projects should be treated like exams. No discussing of questions or sharing code. Any duplicate code will result in zero points for that section.

### Grades:

100% - A+  
 99-92 - A  
 90-91 - A-  
 89 - B+  
 88-81 - B  
 80 - B-  
 79-70 - C  
 69-60 - D  
 <60 - F

### Schedule

Note that dates and readings are tentative. Topics will likely shift; all changes will be updated on the homepage, not necessarily in the syllabus.

Week	Date	Topic	Additional Readings
1	1/16	Introduction and recap	Cumming's new stat, if needed
-	1/18	GLM and Categorical predictors	
2	1/23	Correlation	Correlation Revelle
-	1/25	Univariate Regression	
3	1/30	Univariate Regression	MR Cohen chapter
-	2/1	Partial Correlations	
4	2/6	Multiple Regression	
-	2/8	Multiple Regression	
5	2/13	Multiple Regression	
-	2/15	Assumptions, model diagnostics	
6	2/20	<b>Exam 1</b>	Aiken Chapter
-	2/22	Assumptions, model diagnostics	
7	2/27	Moderation/interaction	
-	3/1	Class Canceled	
8	3/6	Moderation/interaction	Myers chapter
-	3/8	Polynomials	
9	3/13	<b>Spring Break!</b>	
-	3/15	<b>Spring Break!</b>	
10	3/20	Factorial ANOVA	
-	3/22	Factorial ANOVA	
11	3/27	Cont and cat predictors (ANCOVA)	
-	3/29	Logistic regression/GLM	
12	4/3	Over/underfitting and validation	McElrath chapter
-	4/5	Over/underfitting and validation	
13	4/10	Repeated measures/HLM	Hoffman BRM
-	4/12	Repeated measures/HLM	
14	4/17	<b>Exam 2</b>	Kruschke PBR
-	4/19	Bayesian statistics	
15	4/24	Bayesian regression	
-	4/26	Bayesian MLM	
-	5/?	<b>Final Exam</b> TBA	