PSYC489J Syllabus

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Office Hours	By appointment

Goals

When leaving this course, you should be able to:

- reason about and discuss statistical models
- build and interpret linear models in R
- use simulation methodology to avoid assumptions made by null-hypothesis significance testing
- construct sophisticated graphics to aid in the communication of statistical analysis

Description

This course is designed to teach statistics from a model-building perspective. We will discuss the linear model, extending it from t-tests to multiple discrete and continuous predictors. We will also cover the basics of the R statistical computing language in order to build and test these models. Using R and the concepts involved in linear modeling, we will advance to simulation methods, (bootstrapping, MCMC), and visual display of quantitative information.

Schedule

Date	Topic	Reading/Assignment
Jan. 2	R programming language	Healy
Jan. 3	Grammar of graphics	Tufte
Jan. 6	Basic probability and inference	G&H 2
Jan. 7	Linear regression: the basics	G&H 3

Jan. 8	Linear regression: before and after fitting	G&H 4
Jan. 9	Logistic regression	G&H 5
Jan. 10	Simulation methods	
Jan. 13	Simple Bayesian analysis (coins and cards)	
Jan. 14	Markov Chain Monte Carlo	Kruschke Chpt 7
Jan. 15	BEST	Kruschke 2013
Jan. 16	STAN	
Jan. 17	STAN Applied	
Jan. 20	NO CLASS	
Jan. 21	Mulitlevel models	G&H 11-12
Jan. 22	BDA with multiple levels	G&H 13

Reading

Gelman and Hill. (2006). *Data Analysis Using Regression and Multi-level/Hierarchical Models.* ISBN: 978-0521686891
Healy, K. (2013). Choosing your workflow applications.
Kruschke, J.K. (2013). Bayesian estimation supercedes the t test. *Journal of Experimental Psychology: General,* 142(2), 573-603.
Kruschke, J.K. (2010). *Doing Bayesian Data Analysis.* ISBN: 978-0123814852
Try R Codeschool
Tufte, E. (2001). The visual display of quantitative information, 2nd Ed.

Grades

In-class assignments (50%)
Take-home exam (50%)

Every day in class we will have a short assignment on any material we have covered up to that point. A take-home exam will be assigned on January 13th and due on or before January 22nd. We will also do a substantial amount of ungraded work in-class. I will happily review this work upon request, though it will not count for any grade. No curve will be applied until the end of the course, so be conscious of the fact that your performance relative to the class average is the best indicator of your eventual grade.

Standard course policies & grade appeals

You can find most of the standard UMD course policies here. Further guidelines regarding grading and final grade appeals be be found here. Please be aware of these policies.

Only final grades can be appealed above the class level. Should you wish to have a grade on a particular assignment reconsidered, please submit a written statement of no more than 100 words detailing the request for re-grading the assignment. For each written request, I will find a qualified colleague to re-grade the assignment.

Course evaluation

I attempt to incorporate student feedback into my teaching. Sometime before the end of the semester, I would appreciate any thoughts you would be willing to share anonymously through google.