

Introduction to Statistical Modeling in Psychology
PSYC G6006.001
Spring 2012

Monday (lab) & Wednesday (lecture) 10:10 am – 12:00 pm
Location: Schermerhorn 200B

Instructors:

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Textbooks and Readings:

Two required textbooks:

1. Fox, John. (2008). *Applied regression analysis and generalized linear models (2nd ed.)*. Los Angeles, CA: Sage Publications.
2. Fox, John & Weisberg, Sanford. (2011). *An R companion to applied regression (2nd ed.)*. Thousand Oaks, CA: Sage Publications

We will post additional reading on Courseworks throughout the semester.

Course Description:

This course will cover the full arc of statistical modeling in psychology, from model specification to write-up. In particular, it will be a practical introduction to linear regression, ANOVA, generalized linear models, and statistical mediation.

We will introduce topics in Wednesday lectures and discuss them in the following Monday's lab section. Students are expected to attend and participate in both.

Throughout the semester, students will be conducting analyses on their own data. At the end of the semester, each student will organize his/her analyses into a final presentation and paper.

Assignments and grading:

After each Wednesday lecture, students will have the remainder of the week to prepare the related lab, which will be due the following Monday. For each lab assignment, students will (a) generate two discussion points from the reading, (b) answer any assigned problem sets, and (c) complete an analysis of their own data.

The lab assignments are due in lab on Monday. There will be 12 assignments worth, 60 points in total. Students will receive 5 points for on-time assignments and 4 points for late (after Wednesday) assignments and no points for incomplete assignments.

At the end of the semester, students will summarize the analyses of their own data in a 10-15 minute class presentation and written paper. The paper should (loosely) follow an APA format with a brief introduction to the topic, a detailed methods section, a thorough results section, and a concise discussion.

Presentations will be given on April 30th or May 2nd and are worth 20 points (all students are expected to attend both presentations days).

Papers are due on Monday May 7th and are worth 20 points.

Details of the Lab Assignments:

(A) Response to the reading

Students will complete the assigned reading (announced in lecture and posted on courseworks) and generate two responses. These responses should be a short paragraph in length and could be points that the student found interesting, a discussion of a section that was unclear and why, a connection to a previous lecture, etc.—anything that demonstrates active engagement with the reading.

(B) Problem sets

For most labs, students will be required to answer two textbook questions that will be announced in lecture and posted on Courseworks.

(C) Data analysis

Following each lecture, students will submit an analysis of their own data that illustrates the analysis method presented in the lecture (if you do not have your own data, we will help you find a dataset of interest to you). We will describe the analysis to be conducted in a post on Courseworks after each lecture. Answers should conform to the following format:

- Explain what the goal of the analysis for your dataset is.
- Provide R code in Courier New Font and use #to explain your code
- Provide the R output
- Write several sentences interpreting your analyses/results/graphs

Course outline:

Session	Date	Topic
1	Jan 18	Introduction to regression
2	Jan 25	Examining, transforming, and graphing data
3	Feb 1	Linear least squares regression
4	Feb 8	Statistical inference for regression
5	Feb 15	Dummy predictors and interactions
6	Feb 22	History of linear statistical models
7	Feb 29	Diagnostics
8	Mar 7	Logistic regression
Spring Break		
9	Mar 21	The generalized linear model
10	Mar 28	ANOVA and experimental design
11	Apr 4	Mediation
12	Apr 11	Power analysis
13	Apr 18	Course summary
14	Apr 23	Project meetings I *Monday*
15	Apr 25	Project meetings II
16	Apr 30	Class presentations I *Monday*
17	May 2	Class presentations II

Additional Resources:

- The Internet (don't be afraid to ask).
- UCLA has a helpful website: <http://www.ats.ucla.edu/stat/>
- Abstruse help from the R website: <http://www.r-project.org/>
- John Fox's R Companion website: <http://socserv.mcmaster.ca/jfox/Books/Companion/>
- A good matrix/linear algebra class on YouTube: Strang's 18.06 Linear Algebra
- Compilation of R-related blogs: <http://www.r-bloggers.com/>
- Inspirational range of R graphics: <http://addictedtor.free.fr/graphiques/>