Statistics 500: Applied Statistics I

Fall of 2015
Class 2:30-4:00 MW in 260 Weiser Hall

Instructor Information:

Instructor:	Brian Thelen
Office:	443 West Hall
e-mail:	bjthelen@umich.edu
Lectures and Homework:	Posted on CTools in Resources directory – Login webpage is **https://ctools.umich.edu/portal**
Office hours:	4:00-5:00 on Monday, 1:00-2:00 on Wednesday, or by appt

GSI/Grader Information:

GSI and Grader:	Boang Liu
e-mail:	boangliu@umich.edu
Office hours/location:	Tuesday, 3:30-5:00 in in Science Learning Center, 1720 Chemistry

Textbooks:

Primary Text: Julian Faraway (2015) *Linear Models with R, 2nd ed.*, Chapman & Hall.

Supplementary Text: (roughly the last two weeks of the course): Julian Faraway (2006) *Extending the Linear Models with R.* Chapman & Hall.

Course Description:

Linear Regression Models: definition, fitting, Gauss-Markov theorem, inference, interpretation of results, meaning of regression coefficients, diagnostics, influential observations, multicollinearity, lack of fit, robust procedures, transformations, variable selection, ridge regression, principal components regression, ANOVA and analysis of covariance. Introduction to generalized linear models: general framework, binomial data, logistic regression, Poisson regression. The objective is to learn what methods are available and, more importantly, when they should be applied.

Prerequisites:

Matrix algebra, introductory probability and mathematical statistics. If you do not meet the prerequisites, you should not be in the class. If in doubt, talk to the instructor. Some familiarity with computing is helpful, but prior experience with statistical software is not necessary.

Computing:

The software we will be using for this course is R, which can be downloaded for free from www.r-project.org. R is freely available software that runs on both UNIX and Windows. No previous experience with R is required, though there may need to be some investment of time in the early part of the course for utilizing R. For additional background on R, see R resources on Ctools and Appendix A in the textbook.

Lectures:

Lecture notes (with some missing examples and solutions) will be posted on the CTools site in the Resources directory – this will be done at least a day in advance of actual lecture.

Homework:

- There will be almost weekly problem sets – these will be posted on CTools site in the Resources directory. The worst homework score will be dropped. **Late homeworks are not accepted.** If you are unable to attend class on the day a homework is due, e-mail it to your grader before the due date. Solutions for the homework problems will also be posted on CTools site.

- While you are allowed to *discuss* homework problems with each other, all data analysis must be done and written up independently, in your own words. Identical homeworks will receive no credit.

- The homework is graded by the GSIs and any questions about homework grading should be directed to him/her first.

Exams:

There will be a total of 2 exams – both exams will be open book and notes. The final exam is not cumulative. The schedule for the two exams are:

- Exam 1: Thursday, October 22, 6:00-8:00PM in room TBA

- Exam 2: Thursday, December 10, 6:00-8:00PM in room TBA

If you cannot do an exam time for legitimate reasons, you need to contact the instructor at least 2 weeks in advance to discuss and make arrangements for an alternative exam time.

Grading:

Your grade is determined by a weighted combination of the homework and the exams according to the following weights:

Homework: 40%

Exam 1: 30%

Exam 2: 30%