Statistics 530
Spring 2012

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Text: The Statistical Sleuth – A course in methods of data analysis, 2nd ed., Ramsey and Schafer

Course Description: Statistics 530 is the third course in a three quarter sequence in Data Analysis. We assume that students are familiar with organizing and summarizing data, the nature of relationships between variables, sampling distributions and the underlying rationale for hypothesis tests and confidence intervals. We also assume that students are comfortable with a variety of models and inferential procedures. Specifically, the material in 530 relies heavily on the additive model (see the early part of the text for a description of this model), simple linear regression and one-way ANOVA. The course will cover multiple linear regression and ANOVA designs beyond the one-way layout in detail.

The goals for the course are for you to (1) understand the key ideas that underlie the models we’ll work with, (2) appreciate the importance (and unimportance) of the assumptions that the models are based on, (3) be able to make sound decisions for an analysis, (4) implement formal techniques flawlessly, and (5) summarize an analysis appropriately. With these goals in mind, by the end of the quarter, you should be able to design and conduct an experiment of modest size, and you should be able to analyze the data from such an experiment. We will try to accomplish these goals through homework and interactive classroom sessions.

Prerequisites: Statistics 529 or permission of the instructor.

Grading: Course grades will be assigned on the basis of performance on a course project, homework assignments, one midterm exam, and the final exam. The percentage of your final numerical score assigned to each of these three segments of work is

- Project: 10%
- Homework: 20%
- Midterm: 30%
- Final: 40%

The midterm exam will be on or about **Wednesday, May 2**. The final exam will take place at the regularly scheduled time, on **Tuesday, June 5**, from **9:30am - 11:18am**. The final exam
will be held in the regular classroom, SON 0050. If you have a question about the grading of an exam or homework assignment, please write a brief note explaining your question, attach it to the front of the assignment, and turn it in to the instructor. We’ll quickly get back to you with a response.

**Exam rules:** You will be permitted to bring along one standard sized sheet of notes for the midterm exam. For the final exam, you may bring along two sheets. You may write on both the front and back of the sheets.

**Homework assignments:** Homework will be collected approximately weekly, making for about 7 homework assignments. Homework solutions will be made available on-line at the course web-site. Homework will be accepted late, but points will be deducted for turning the homework in late. Homework will not be accepted after the solutions are available. A subset of problems from each assignment will be graded. Before computing your homework grade, your lowest score will be dropped.

**Computer work:** Many of the analyses for the course will be done on the computer. When you put together your homework solutions, be sure to cut-and-paste so that the TA can follow your work. You may lose points on the homework if the TA has trouble following the thread of your solution.

**Course Project:** The course project will be due at 5:00 p.m. on the last day of classes of the quarter—Friday, June 1. It is a group project, with a group consisting of up to four individuals, all of whom must be enrolled in Stat 530. The course project is to consist of a data analysis of your choosing, preferably relying primarily on techniques that have been covered in the Stat 528-530 sequence. The data analysis should be fairly complete. It should include a brief description of the problem that the data addresses, how the data were collected, and what the data are. The analysis should examine many of the issues covered in Stat 528-530. Enough detail should be presented for me to follow the analysis; many details should be relegated to an appendix containing material that supports and documents the analysis. The analysis should conclude with a description of what the data have to say about the problem that motivated their collection. The data for your course project could be data that you’ve collected (either experimentally or obtained from some source, perhaps on the web), or they can be data that you have obtained from an article. Articles and sources of data must be appropriately referenced.

**Web Site:** There is a course web-site for STAT 530. The location of the web site is

http://www.stat.osu.edu/~snm/530/index.html

You will find links to the course web page on the Statistics department’s web page, and also on my web page. The web page will have pdf files of the homework assignments available for downloading. A select set of course handouts will also be available.

One warning on the web site. The Statistics department is currently adjusting its web addresses. This may have an impact on links to/from the course web page. If you run into troubles, let me know.