

STAT 6750

Statistical Consulting

FALL 2017

Instructor: Steve MacEachern

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Office Hours: Monday, 3:30 - 4:30; Thursday, 2:00 - 2:50, subject to change

Grader: Deborah Kunkel

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Lectures: Tuesday and Thursday 8:00 - 8:50. University Hall 0043.

References: There are many good texts on the various aspects of statistical consulting. We have listed a few below.

- Boen and Zahn, *The Human Side of Statistical Consulting*, I
- Cabrera and McDougall, *Statistical Consulting*, I
- Chatfield, *Problem Solving: A Statistician's Guide*, A
- Cox and Snell, *Applied Statistics*, A
- Derr, *Statistical Consulting: A Guide to Effective Communication*, I
- Knuth, Larrebic and Roberts, *Mathematical Writing*, P
- Madansky, *Prescriptions for Working Statisticians*, A
- Polya, *How to Solve It: A New Aspect of Mathematical Method*, A
- Polya, *Mathematics and Plausible Reasoning*, vols. 1 and 2, A
- Tufte, *The Visual Display of Quantitative Information*, P

These books can loosely be divided into three groups—those which focus on the interpersonal aspects of consulting (e.g., how to deal with a difficult client), those which focus on good, solid applied statistics (e.g., how to handle imperfections in an experiment; how to look for patterns in the world), and presentation of results (e.g., how to write!). The code letters following the books above (I, A, P) indicate the main thrust of each. The list could be greatly expanded. During the course, we will draw material from these sources and others.

Course Description: Statistics 6750 is a course on statistical consulting. As the texts mentioned above indicate, there are many aspects to consulting. There is, quite decidedly, no single route to effective consulting. Rather, different environments place more or less emphasis on one aspect or another of performance. Academics and government tilt toward a focus on applications and techniques; corporate environments tilt toward slick presentations. What is “best” is situation dependent. We will cover a variety of styles of consulting.

Course Policies: Given the material covered by the course, the format will be interactive rather than traditional lecture. Be prepared to discuss examples and course material as it arises. As part of the course, I will call on you (yes, you!) to provide brief descriptions of reasonably standard statistical techniques. The descriptions may be tied to a description of a client—for example, a client who is scientifically sophisticated but who has little sophistication when it comes to statistical analysis. For these, you will have no warning beforehand.

Course requirements: To receive a satisfactory grade in this course, you must

1. Attend at least 80% of the class meetings
2. Participate in the discussions in class
3. Turn in satisfactory written assignments
4. Have satisfactory performance on in-class presentations
5. Turn in (and present) a satisfactory final report

Final reports and presentations: The final report will be much grander than the homework exercises that you will turn in during the course.

1. A statistical consulting project in which you are involved
2. A set of data that you have collected and analyzed
3. A critical review of the statistics in a journal article that you have read
4. A statistical topic that is new to you
5. A specialized piece of software or specialized statistical routine that is new to you

The length of the written report will depend on your choice of topic, but it should be in the neighborhood of six to eight pages. For reports that make heavy use of descriptive and inferential statistics and those that contain appendices, the total length of the report will naturally be longer.

In addition to the written report, you will give a presentation to the class. The length and style of the presentations will be determined once registration issues are settled. In addition to the presentation, expect a short question and answer period to follow. The presentations will take place during the last class meetings and the scheduled final exam period. You are expected to attend other students' presentations and to participate in the question and answer sessions.