1 Home Page

Currently, course materials can be found at:

http://legacy.orie.cornell.edu/~davidr/or678/

At some point in time, the course materials will be moved Blackboard.

2 Class Times

TR, 1:10–2:25, OH 216

Note: There will be no class on Sep 11, Sep 13, and Nov 1. These classes will be made up during the study break and final exam periods when students will give oral reports.

3 Prerequisites

The ideal prerequisites are ORIE 670 and ORIE 651 or the equivalents. However, students with somewhat less preparation, for example, a student with Math 413 and Math 472 should be able to handle this course.

Measure-theoretical probability is the language of mathematical statistics. This course will not make extensive use of measure theory, but you need to be comfortable with it, e.g., you should not be frightened or puzzled by notation such as $E\{g(X)\} = \int g(x)f_X(x)d\mu(x)$. (If you are, ask me for some help.)

4 Academic Integrity

Academic Integrity will be maintained at all times in this course. It is the course policy that you may NOT work with other students on homework or on the course project. Please review Cornell’s Code of Academic Integrity which can be found, for example, at http://www.cuinfo.cornell.edu/Academic/AIC.html.

5 Instructors

David Ruppert, 225 Rhodes Hall, 255-9136, dr24@cornell.edu,
http://legacy.orie.cornell.edu/~davidr

6 Syllabus

The lectures will include the following topics:

- Comparison of four approaches to statistics: frequentist, likelihood, fiducial, and Bayesian
- posterior distributions
- Bayesian analysis
- Bayesian decision theory
- Bayes factors
- large-sample theory
- Bayesian computations
- Software: R and WinBugs
- empirical Bayes methods
- Bayesian robustness
- hierarchical models
- additional topics as time permits

7 Textbook


The lectures will be based on this textbook, several other books, the classical papers on Bayesian statistics, and recent journal articles. The following books are worth consulting:

- Congdon, Peter (2001), *Bayesian Statistical Modelling*, John Wiley & Sons (New York; Chichester)
- Dey, Dipak (ed), Müller, Peter (ed), and Sinha, Debajyoti (ed) (1998), *Practical Nonparametric and Semiparametric Bayesian Statistics*, Springer-Verlag Inc (Berlin; New York)
I intend to cover a number of papers including the following:


The course will stress theory and is intended prepare students to do research. However, the students will also be introduced to R and WinBUGS software and applications will be discussed.

8 Grades

Grades will be based upon class participation, homework, and a course project that will involve reading the literature on a topic and presenting oral and written reports.

August 23, 2007