STATISTICS 870-4
APPLIED PROBABILITY MODELS

Fall 2002
DAY COURSE

Instructor: DR. L. WELDON

Textbook:

Introduction to Probability Models by S.M. Ross. Publisher Harcout/Academic Press. Seventh Edition, 2000.

Prerequisite:

A course in probability comparable to STAT 280. Any additional background in Stochastic Processes, such as STAT 380, would be helpful but is not required.

Meeting Schedule:

A time will be arranged for the class that does not conflict with other400-level or graduate courses in Statistics. Interested students should send me their e-mail address so I can alert them to the time and place of the first meeting.

Course Outline:

The course is based on the text "Introduction to Probability Models", Seventh Edition, by Sheldon Ross, Academic Press, 2000. Wewill supplement the text with the use of statistical software when this helps with understanding or reveals phenomena not apparent from the probability formulas.

The course starts with a review of discrete and continuous probability models, conditioning, expected value, and how statistical software can help to increase intuition in working with these basic tools and concepts. (Ch1 and 2). We then focus on the use of conditioning to simplify some apparently hard problems (Ch 3). The very useful stochastic process models, discrete-time Markov Chains and continuous time Poisson Processes, are covered in Ch 4 and Ch 5. Selected topics will be drawn from Continuous Time Markov Chains (Ch 6), Renewal Theory (Ch 7),Queueing Theory (Ch 8), and Stationary Processes (Ch 10).

Throughout the course we will be stressing the applications of the probability modeling approach to studying real-life phenomena. The idea that observation of a phenomenon is a kind of data brings this subject into the realm of data analysis, and is an important part of the statistician's tool kit. It is hoped that the combination of practical utility and the charm of probability phenomena will provide students with a memorable and useful course.

Students may use any statistical software that they choose. However, the software must be capable of the simulations arising naturally from the course material, and must be able to produce reasonable graphs to display simulation results.

Grading:

60% assignments and projects, and 40% final exam.

Students should be aware that they have certain rights to confidentiality concerning the return of course papers and the posting of marks. Please pay careful attention to the options discussed in class at the beginning of the semester.

Revised June 2002