STAT 550 Fall 2009
Applied Probability Professor Bailey

Syllabus

Course Web Page: `http://rohan.sdsu.edu/~babailey/stat550`
and `blackboard.sdsu.edu`

Meeting Time: Lectures: MWF 1:00 - 1:50 p.m. in EBA 340

Instructor: Professor Barbara Bailey
GMCS 513
email: babailey@sciences.sdsu.edu
Office Hours: M 11:00 - 12:00 p.m., W 2:00 - 3:00 p.m; by appointment

Reference: The textbook for the course is

Higgins, J. J. and Keller-McNulty, S. (1995). *Concepts in Probability and Stochastic Modeling.* Duxbury Press

Objectives: Probability and stochastic models are the building blocks for studying variability and uncertainties in scientific experiments, sociological studies, and statistical inferences. This course will provide you with a basic understanding of the probability theory and methods relevant to scientific inquiries and a basic proficiency in Monte Carlo simulations. The goal is to improve your skills in probabilistic thinking through the development and application of stochastic models in observational, experimental, and computational settings. Additionally, the material will teach you how to approach scientific problems from a probabilistic perspective towards critical reading and evaluation of the scientific literature and research results.

Homework: Homework assignments will be regularly available on the course blackboard page as announced in class. The exact due date for each homework will be given at that time. The homework will contain a series of practice problems of which *selected problems* **will** be graded. The graded problems will be clearly specified on the class web page. The homework will also contain a series of practice problems which will not be handed in nor graded. The homework serves as a tool to review and practice the material covered in class. All material covered on the assignments can be questioned on the exams.

Homeworks must be handed in by the beginning of lecture on the due date. **Late homework will not be accepted, electronic (email) homework submissions will not be accepted.** Some problems may require computing and must include concise computer output with a clearly presented version of your code. You may drop your lowest percentage score.

You are encouraged to discuss homework problems with other students, but you should write up your solutions independently. **Your homework solutions for problems requiring computing must include concise computer output properly edited, labeled, and neatly displayed.**

Exams: There will be three in-class exams on Fridays September 25, October 23, November 20. The exams will be closed book. A hand calculator is necessary for all exams.

Each exam will be worth 100 points. You will be allowed to drop your lowest exam grade. **No makeup exams are given - no exceptions**.

The final exam will be given Monday, December 14 from 1:00 p.m. to 3:00 p.m. in EBA 340. The final will be cumulative and comprehensive.

Grading: The grade for the class is based on a score composed of the following.

Homework	15 %
Exams (Best 2 out of 3)	50 %
Final Exam	35 %

Computing: Some homework assignments will require use of a computer package for probability calculations and simulations. Computer output required for homeworks must be properly edited, labeled, and neatly presented. Exams may have questions utilizing computer output for the probabilistic solutions.

We will the use *R* as a statistical and simulation software tool for the course. *R* is installed on the PCs in GMCS 422/428. You may also download *R* from the web site `www.r-project.org`. The *R* project web site and course web page contain links to primers and introductory materials on *R*. We will have an introduction to *R* session during one of the classes, time to be announced. Nevertheless, this is a course in probability, not in computing. **It is your responsibility to learn *R*.**

Teaching Furlough Days: There will be no class on Wednesday November 25 and Friday December 11.

Topics to be covered: basic outline; topics may be added and/or dropped as the semester proceeds.

Building blocks

1. Introduction to probability
2. Probability models
   a. Discrete distributions
   b. Continuous distributions
   c. Distributions of extreme values

Applications

1. Statistics and simulation
   a. Statistical inference
   b. Monte Carlo methods
   c. Bootstrap and permutation procedures
2. Stochastic processes
   a. Bernoulli and Poisson processes
   b. Markov chains
3. Special topics
   a. Statistical inference
   b. Renewal processes
   c. Reliability
   d. Bayesian methods

Prerequisites: MATH 151: Calculus II and MATH 254: Introduction to Linear Algebra. Experience in computer programming is recommended.

Tardiness and Early exits: The class time is from 1:00 - 1:50 p.m. As common courtesy to your fellow students, we would appreciate if you show up to class on time and leave when dismissed at 1:50. If you must leave early, please inform me and sit on the aisle near an exit so as not to disturb students listening to and trying to learn from the lectures.

Code of Academic Conduct on Examinations and Assignments: "At San Diego State University, students are invited to be active members of the educational community. As with any community, its members serve a vital role in determining acceptable standards of conduct, which includes academic conduct that reflects the highest level of honesty and integrity." The "Statement of Student Rights and Responsibilities clarifies for students their role as members of the campus community, setting forth what is expected of them in terms of behavior and contributions to the success of our university." "Inappropriate conduct by Students ... is subject to discipline on all San Diego State University Campuses. The Center for Student Rights and Responsibilities coordinates the discipline process and establishes standards and procedures in accordance with regulations contained in Sections 41301-41304 of Title 5 of The California Code of Regulations, and procedures contained in Executive Order 628, Student Disciplinary Procedures for The California State University." See http://www.sa.sdsu.edu/srr/judicial for more information.

Other information: See course web page: http://rohan.sdsu.edu/~babailey/stat550