CSCI 668: RELIABILITY

Fall, 2006; TR 3:30-4:50; Jones Hall, Room 302

Instructor: Larry Leemis
Office: Jones 101C (Phone: 221-2034)
Office hours: Tuesday and Thursday 2:00 - 3:20 (or by appointment)

Purpose:

This course introduces probabilistic models and statistical methods used in the analysis of reliability problems. The first half of the course examines probabilistic models for the lifetime of a system of components, and the last half of the course considers statistical methods which can be applied to a data set of survival times. Specific goals include:

1. Provide a review of probability and statistics;
2. Understand reliability theory at the level of the current archival literature. This semester, you will read articles from *Journal of the American Statistical Association*, *IEEE Transactions on Reliability, Naval Research Logistics, Technometrics, Journal of Quality Technology, Mathematics and Computers in Simulation,* and *Management Science.*
3. Understand the relationship between actuarial science/biostatistics/reliability;
4. Use computer software, e.g., S-Plus, to solve reliability problems.

Prerequisites:

Students should have a working knowledge of probability, statistics, and computer programming.

Texts:

Leemis, L. (1995), *Reliability: Probabilistic Models and Statistical Methods,* Prentice-Hall, ISBN: 0-13-720517-1.

Grades:

Course grades will be determined by these weights:

Homework	25%
Midterm	25%
Project	20%
Final Exam	30%

The grading scale for the course is (+ or – may be added within each grade level):

90 - 100 %	A
80 - 90 %	B
70 - 80 %	C

Homework:

A weekly homework set will be due at the beginning of each Thursday class period. No late homeworks will be accepted.

Project:

Each student will submit a semester project on a topic involving some aspect of reliability. Topic selection must be done prior to fall break. The final report is due on the last day of class.

Course outline:

1. Introduction
2. Coherent Systems Analysis
3. Lifetime Distributions
4. Parametric Lifetime Models
5. Specialized Models
6. Repairable Systems
7. Lifetime Data Analysis
8. Fitting Parametric Models to Data
9. Parametric Estimation for Models with Covariates
10. Nonparametric Methods and Assessing Model Adequacy