CSCI 678: Statistical Analysis of Simulation Models
Spring, 2024
TR 2:00 – 3:20 Jones 113

Instructor: Larry Leemis
Office: Jones 116
Office hours: TR 3:30-4:45, or by appointment

Purpose:

This course introduces techniques used in the analysis of simulation models. The first half of the course will be spent on determining appropriate input to a simulation model, and the last half will be spent on analyzing the output from a simulation model.

Prerequisites:

A working knowledge of probability, statistics, and computer programming in the R language.

Textbook:

There is no required textbook for the course, but two recommended texts are:

Law, A., *Simulation Modeling and Analysis,* Fifth Edition, McGraw-Hill, 2015.

Chatfield, C., *The Analysis of Time Series: An Introduction,* Sixth Edition, Chapman & Hall/CRC Press, 2004. ISBN: 1-58488-317-0.

Grades:

Course grades will be determined by these weights:

Homework	25%
Midterm	25%
Project	10%
Final Exam	40%

The grading scale for the course will be:

90 – 100 %	A
80 – 90 %	B
70 – 80 %	C

Plus and minus grades may be assigned within each range.

Homework:

A homework set will be assigned weekly. Each homework set is due at the beginning of the class one week after it is assigned.

Project:

A research-oriented semester project on a topic involving a simulation technique is due on the last day of class. A one-page description of the topic is due by spring break.

Course outline:
1. Simulation overview
2. Probability and statistics review
3. Input modeling
4. U(0,1) generators
5. Generating random variates
6. Time series analysis
7. Output analysis for a single system
8. Ranking & selection
9. Variance reduction techniques
10. Experimental design, sensitivity analysis, and optimization