CSCI 678: Statistical Analysis of Simulation Models
Spring, 2018
TR 11:00 - 12:20 Morton 203

Instructor: Larry Leemis
Office: Jones 116
Office hours: TR 2:00-3:15, or by appointment

Purpose:
This course introduces students to 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. Some preliminary homework assignments on simulation programming will be assigned.

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

Textbooks:

Grades:
Course grades will be determined by these weights:

<table>
<thead>
<tr>
<th>Component</th>
<th>Weight</th>
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<tbody>
<tr>
<td>Homework</td>
<td>30%</td>
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<tr>
<td>Midterm</td>
<td>30%</td>
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<tr>
<td>Project</td>
<td>10%</td>
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<td>Final Exam</td>
<td>30%</td>
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The grading scale for the course will be:

<table>
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<th>Grade Points</th>
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<tr>
<td>90 - 100 %</td>
<td>A</td>
</tr>
<tr>
<td>80 - 90 %</td>
<td>B</td>
</tr>
<tr>
<td>70 - 80 %</td>
<td>C</td>
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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:
Each student will submit a research-oriented semester project on a topic involving a simulation technique. The final report 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