Computer Science 394 – Fall 2006
Simulation

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Course Description

When real-world experiments are either too dangerous or too expensive to perform, computer simulation is used as an alternative. In addition to considering how to model real-world problems using computer simulation, this course studies other relevant topics including how to generate random data using a deterministic machine and how to collect and display data in a meaningful way.

Goals

- Produce random data on a deterministic machine

- Efficiently implement simulations of specific models

- Verify that a model is implemented correctly

- Display data effectively

Reading

The text for the course is *Discrete-Event Simulation: A First Course* by Steve Park and Lawrence Leemis. We will work closely with the text, and I will assume that you have read carefully all assignments.

Graded Material

- **Homework** – The homework questions given in the book are one of its strengths. For each section we cover, I will assign one or two of these problems. Each problem requires one to three hours of work including re-reading the text for required details, planning how to solve the problem, writing and testing the necessary programs, collecting data, and preparing graphs and other material for presentation. During this time, you are strongly encouraged to collaborate with the other students in the course.

  Approximately every third class period will be used to review homework problems. Students will present their approach to the problem and their results to the class, and then we will discuss the significance in terms of the course goals.

  After these discussions, students will prepare a write-up for each problem in LaTeX. These solutions should be written in the *other student context.* You should provide enough written

explanation so that another student in the class, who did not know how to complete the exercise, could read the submitted material and, without asking questions, understand what should have been done. Written responses which consist entirely of printed source code (even if bullet proof and well documented) are incomplete and poorly written.

- **Projects** – Two projects will be assigned during the semester. Each will require you to design, implement, and verify a simulation and to use this simulation to collect data that will demonstrate some meaningful result. You will have the opportunity to pick a topic of your own or from a list I provide. At the conclusion of the project, class time will be devoted to the presentation of the simulations and your results.

- **Midterm** – One take-home midterm will be handed out on Friday, October 6. It will be due in-class on Friday, October 20, and we will spend that day presenting and discussing solutions. On this test you are not allowed to collaborate with others.

- **Final exam** – The final exam will also be take home. It will be handed out toward the end of the semester and due at the scheduled exam time, where we will present and discuss solutions.

Grade Determination

Homework	40%
Projects	20%
Midterm	20%
Final	20%

All grades will be calculated on the standard scale using pluses and minuses.

If you have a disability that may affect your participation in this course, please contact me immediately to discuss academic accommodations.