

INSY 7400: Simulation Modeling and Analysis

Fall 2008

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Credit Hours: 3

Prerequisites: STAT 3610 or equivalent

Course Text and Reference Books:

Course Text: Kelton, D. W., R. P. Sadowski, and D. T. Sturrock, *Simulation With Arena, 4th Edition*, McGraw-Hill, Boston, MA, 2004.

Reference Text: Law, A. L., *Simulation Modeling and Analysis, 4th Edition*, McGraw-Hill, New York, NY, 2006.

Reference Text: Banks, J., J. S. Carson, B. L. Nelson, and D. M. Nicol, *Discrete-event Simulation, 4th Edition*, Prentice Hall, Upper Saddle River, NJ, 2005.

Reference Text: Nelson, B. L., *Stochastic Modeling : Analysis and Simulation*, McGraw-Hill, New York, NY, 1995.

Course Description: Introductory graduate course in discrete event modeling and simulation. Covers the foundational concepts of event-oriented and process-oriented simulation and the application of those concepts using commercial simulation software.

Course Objectives: Students should understand the basic concepts of simulation modeling and analysis and have experience developing simulation models in the simulation package Arena. In addition, students should have experience with input data modeling, output analysis and using simulation models to analyze complex systems.

Course Topics:

1. Introduction, Background, Probability and Statistics Review
2. Event-oriented and Process-oriented Simulation
3. Introduction to Arena
4. Input Modeling and Analysis
5. Output Analysis and Experimentation
6. Variance Reduction
7. Intermediate and Advanced Modeling Techniques
8. Monte Carlo Simulation
9. Applications of Simulation

Course Requirements/Evaluation:

<i>Item</i>	<i>Due Date</i>	<i>Weight</i>
Midterm	TBD – possibly on 10/9	30%
Final Exam	Tue., Dec. 16, 4:00 pm – 6:30 pm	40%
Homework	Various	30%

Class Policy Statements: There will be no unannounced quizzes. Course attendance is recommended, but will not be evaluated as part of the course grade. Similarly, it is expected that students will materially participate in class discussions, but such participation will not be part of the formal evaluation.

Calculator Policy: As stated in the Tiger Cub, any violation of the academic honesty code will be reported to the Academic Honesty Committee. To avoid academic dishonesty, students are not to have calculators that store text and/or can connect to Bluetooth devices during class. The only calculators that are acceptable for in class exams or quizzes TI-30XA, TI-30XIIB, and TI-34II.

Disabilities: Any student with a disability needing special accommodation should notify the instructor and contact Dr. Kelly Haynes, Director of the Program for Students with Disabilities, located in 1244 Haley Center.

Justification for Graduate Credit: Simulation is quickly becoming a very important system analysis methodology. This course covers significantly more material than does the undergraduate simulation course and includes more advanced input/output analysis, variance reduction, and random variate generation material.

Academic Honesty: All portions of the Auburn University student academic honesty code (Title X11) found in the Tiger Cub will apply to this class. All academic honesty violations or alleged violations of the SGA Code of Laws will be reported to the Office of the Provost, which will then refer the case to the Academic Honesty Committee. Violations include, but are not limited to:

1. *Cheating on an examination* - This includes such things as copying from another's paper, using unauthorized notes, calculators, etc., or giving or receiving unauthorized aid, such as trading examinations, whispering answers, passing notes, or using electronic devices to transmit or receive information.
2. *Plagiarism* - This is using someone else's work without giving credit. It is, for example, using ideas, phrases, papers, laboratory reports, computer programs, data - copied directly or paraphrased - that you did not arrive at on your own. Sources include published works such as book, movies, web sites, and unpublished works such as other students' papers or material from a research service. In brief, representing someone else's work as your own is academically dishonest. The risk of plagiarism can be avoided in written work by clearly indicating, either in footnotes or in the paper itself, the source of any major or unique idea or wording that you did not arrive at on your own. Sources must be given regardless of whether the material is quoted directly or paraphrased.
Copying another student's assignment and putting your name on it is plagiarism.
3. *Unauthorized collaboration* - This is working with or receiving help from others on graded assignments without the specific approval of the instructor. If in doubt, seek permission from the instructor before working with others. Students are encouraged to learn from one another: Form study groups and discuss assignments, but each assignment must be individual work unless specifically stated and turned in as a group assignment. You are encouraged to talk to one another about your assignments, however, all assignments must be done by the student(s) whose name is (are) on it!
4. *Multiple submission* - This means using the same work to fulfill the academic requirements in more than one course. Prior permission of the instructors is essential.