

ISYS 4065: Discrete Systems Simulation

Catalog Description

ISYS 4065. Discrete Systems Modeling. (3) (F) 3 lecture hours per week. P: MATH 3307, MATH 2154. Simulation with emphasis on discrete event models. Model building, data integration, verification and validation, statistical analysis of simulation results, and applications to engineering problems

Required Materials:

1. Kelton, W. David, Randall Sadowski, and Deborah Sadowski. Simulation with ARENA, 4th Edition. WCB/McGraw-Hill, 2007. (ISBN-13: 978-0-07-352341-5)

Course Objectives:

Upon completion of this course, students shall be able to:

- Specify simulation model parameters and distributions for input data
- Build simulation models using a computer software package
- Perform statistical analysis on simulation results
- Identify the issues and methods of analyzing simulation output
- Develop, structure, and analyze methods of verification and validation in simulation modeling
- Apply discrete event simulation analysis techniques to decision making and system optimization problems

Lecture Topics:

- Basics of simulation concepts and randomness (2 hours)
- Simulation processes (3 hours)
- Arena basics (3 hours)
- Modeling basic operations and inputs (2 hours)
- Specifying model parameters and distributions (2 hours)
- Simulation modeling operations (3 hours)
- Serial processing and queuing (3 hours)
- Parallel processing (2 hours)
- Task time variability (3 hours)
- Resource schedules (3 hours)
- Resource failures (2 hours)
- Finding and fixing errors (3 hours)
- Fitting input distributions and Input Analyzer (2 hours)
- Terminating or steady-state (2 hours)
- Statistical analysis using Output Analyzer, Process Analyzer, and OptQuest (4 hours)
- Tests (3 hours)

Grading:

Grading		Assessment	
A	90% or better	Homework/Assignments	15%

B	80% or better		Project / paper	15%
C	70% or better		Tests (2) @20% each	40%
D	60% or better		Final Exam	30%
F	Less than 60%		Total	100%