

## SIMULATION

IE 306 (M 10:00-11:30; W 15:00-16:30. PS: M 11:30-13:00)

Fall Semester 2009

PREREQUISITES: Statistics, Probability and Computer Programming

INSTRUCTOR: Yaman Barlas, Tel. 6407.

OFFICE HOURS: Monday: 14:00-15:00

Tuesday: 10:00- 12:00,

Wednesday:14:00-15:00

(You must call and make an appointment if you must see me outside the office hours).

COURSE ASSISTANTS: Çağatay Tezcan, Onur Özgün

COURSE OBJECTIVES: To teach students the basic concepts and algorithms of simulation modeling/analysis, in particular discrete-event simulation. To introduce them to a specific computer simulation language (ie. Arena/SIMAN). To enable them to apply their probability and statistics knowledge to simulation modeling, input and output data analysis.

### REQUIRED TEXT:

Banks, Jerry and J.S. Carson, II., B.L. Nelson and D.M. Nicol, *Discrete Event System Simulation*, fourth edition, New Jersey, Prentice-Hall, 2005.

### REFERENCE TEXTS:

Your introductory probability and statistics books.

GRADING: Assignments: 15%

Exam No. 1: 25%

Exam No. 2: 25%

Final Exam: 35%

ASSIGNMENTS: There will be several homework/programming assignments. These are to be done individually by each student. You may only discuss conceptual questions with your friends; you are expected to do the actual specific work individually. No Homework will be accepted after its due date.

EXAMS: There will be two hourly midterm exams, and one two-hour comprehensive final exam. I will give you more specific information on the nature of these exams several days before each test.

## OUTLINE

<u>WEEK</u>	<u>TOPIC</u>
1	Course Organization and Overview
1	Introduction to Simulation Modeling
2	Continuous vs. Discrete Simulation
2	Discrete-Event Simulation Examples
3	Discrete-Event Simulation Principles
4	Event Scheduling Approach
5	Process Interaction Approach
5	Random Number Generation
6	Testing Random Number Generators
7	Input Data Analysis: Review & Estimation
7	Exam NO.1
8	Input Data Analysis: Goodness-of-fit
9	Random Variate Generation
9	Inverse Transformation Technique
10	Acceptance-Rejection Techniques
10	Some Special-Purpose Techniques
11	Simulation software (Arena/SIMAN...)
12	Arena/SIMAN
12	Exam NO. 2
13	Model Verification and Validation
13	Statistical Analysis of Simulation Output