

# Digital Simulation Techniques

ESI 6529, Fall 2014

**Catalog Description (3 credit hours)** – Computer programming aspects of digital simulation. Deterministic simulation; stochastic simulation. Use of simulation languages.

**Pre-requisites and Co-requisites:** computer programming and probability theory.

## Course Objectives

The purpose of this course is to introduce the basic techniques for modeling and simulating industrial systems in the presence of uncertainty. After successfully completing this course, you would be able to:

Understand the major capabilities and limitations of simulation as applied to industrial problems.

Apply simulation to model and analyze simple engineering design problems.

\* Students are required to do a term project, as detailed in a separate handout.

## Course Schedule:

Week	Class Subject	Chapter	Tuesday		Thursday	
			Date	Task	Date	Task
1	Introduction	1	23-Aug		25-Aug	
2	Basic Probability and Statistics	App B	30-Aug		1-Sep	
3	Generating Random Number	12	6-Sep		8-Sep	
4	Simulation Concepts (Queueing Theory)	2	13-Sep	Homework due	15-Sep	
5	Simulation by Hand	2	20-Sep	Project-team Introduction	22-Sep	
6	Exam		27-Sep		29-Sep	Exam 1
7	Basic modeling using Arena	3, 4	4-Oct		6-Oct	
8	Basic modeling using Arena	3, 4	11-Oct	Homework due	13-Oct	
9	Modeling Detailed Operations, Lab class	5	18-Oct	Project Proposal due	20-Oct	
10	Output Analysis	6,7	25-Oct		27-Oct	
11	Output Analysis	6,7	1-Nov		3-Nov	
12	Entity Transfer, Lab class	8	8-Nov	Homework due	10-Nov	
13	Exam		15-Nov		17-Nov	Exam 2
14	Project and group meetings	-	22-Nov		24-Nov	No Class
15	Project presentations	-	29-Nov		1-Dec	
16		-	6-Dec	Project report due	8-Dec	No Class

## Instructor

Name: Nahid Jafari

Office location: 474 Weil Hall

Telephone:

E-mail address: nahid.jafari@ufl.edu

Class Web site: Canvas

Office hours: Wednesday 10:00-11:00 am; or by appointment

## Teaching Assistant

Name: TBA

Office location:

Telephone: N/A

E-mail address:

Office hours:

**Meeting Times:** Tuesday, Period 2 (8:30–9:20 am); and Thursday, Period 2,3 (8:30–9:20, 9:35-10:25am).

**Meeting Location:** CSE E107

### **Textbooks and Software Required**

W. David Kelton, Randall P. Sadowski and David T. Sturrock, “Simulation Using ARENA”, 5<sup>th</sup> Edition, McGraw-Hill, 2007. (KSS)

*To install a freely available student version of Arena, please follow Appendix D in Page 609 of the above textbook.*

### **Recommended Reading**

Averill M. Law, “Simulation Modeling and Analysis,” 4<sup>th</sup> Edition, McGraw-Hill, 2007. (Law)

**Grading:** Your grade will be based on a mid-term exam, homework assignments and a term project.

Homework: 20%

Mid-term exam 1: 20%

Mid-term exam 2: 20%

Term project: 40%

### **Standard Grading Scale:**

Grade	Range
A	90-100
B+	85-89
B	80-84
C+	75-79
C	70-74

In order to graduate, graduate students must have an overall GPA and an upper-division GPA of 3.0 or better (B or better). Note: a B- average is equivalent to a GPA of 2.67, and therefore, it does not satisfy this graduation requirement.

### **Attendance and Expectations**

Attendance is very strongly encouraged. Please do not try to rely solely on the book if you miss class, obtain and review the notes before coming to the next class.

Homework must never be copied. You may certainly ask others for conceptual advice on problems, but copying homework or turning in homework answers that you do not completely understand is strictly prohibited, and will result in a grade of zero for the assignment.

**Make-up Exam Policy:** Make-up exams can be granted only if a student provides a documented acceptable reason for not being able to attend a regularly scheduled exam. All make-up requests must be submitted to the instructor BEFORE the scheduled exam date. Tentative exam dates: midterm exam 1– **Thursday Sep 29** (in class), midterm exam 2– **Thursday Nov 17 ET**. EDGE students will take the exams according to the standard procedure: the exam will be sent to your

proctors on the exam date, and you will have *at least two business days* to complete the exam and have your proctor send it back to the instructor.

**Honesty Policy:** All students admitted to the University of Florida have signed a statement of academic honesty committing themselves to be honest in all academic work and understanding that failure to comply with this commitment will result in disciplinary action. This statement is a reminder to uphold your obligation as a UF student and to be honest in all work submitted and exams taken in this course and all others.

**Software use:** All faculty, staff, and students of the University of Florida are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate. We, the members of the University of Florida community, pledge to uphold ourselves and our peers to the highest standards of integrity.

**Course evaluations:** Students are expected to provide feedback on the quality of instruction in this course by completing online evaluations at <https://evaluations.ufl.edu> (Links to an external site.). Evaluations are typically open during the last two or three weeks of the semester, but students will be given specific times when they are open. Summary results of these assessments are available to students at <https://evaluations.ufl.edu/results/>. (Links to an external site.)

**Accommodation for students with disabilities:** Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, [www.dso.ufl.edu/drc/](http://www.dso.ufl.edu/drc/)) by providing appropriate documentation. Once registered, students will receive an accommodation letter which must be presented to the instructor when requesting accommodation. Students with disabilities should follow this procedure as early as possible in the semester.

**UF counseling services:** Resources are available on-campus for students having personal problems or lacking clear career and academic goals. The resources include:

- University Counseling Center: 301 Peabody Hall, 392-1575, Personal and Career Counseling.
- SHCC Mental Health, Student Health Care Center, 392-1171, Personal Counseling.
- Center for Sexual Assault/Abuse Recovery Education (CARE), Student Health Care Center, 392-1161, Sexual Assault Counseling