

ISE 435 Discrete Systems Simulation  
Fall Semester 2019  
Lecture: TuTh 2:00 - 3:20 pm, KAP 140  
Lab: Th 5:00-5:50 pm, SAL 127  
Web Site: blackboard.usc.edu

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**Objective:** In this course, you will learn how to create computer models of discrete event systems, and how to use these models to make decisions about the design/improvement of the actual physical systems that the models represent. You will learn how to evaluate a business system and identify the input and output variables. You will learn how to evaluate field data to obtain input information and how to evaluate output predictions from the simulation model to select effective operating policies.

**Text:** Khoshnevis and Palmer, Discrete Systems Simulation, reader

**Course Material:** Chapters 1-6 of the text, plus topics discussed in lecture by the instructor

**Grading Policies:**

Points Breakdown -

Homework	120
Project	150
Exam #1	115
Exam #2	<u>115</u>
Subtotal	500
Final Exam	150

Course GRADES will be determined by the distribution of point totals for the class. “Natural groupings” will be used to assign letter grades. The highest scoring group will receive A’s, the next group is the B’s, and so on. A single point will not be the difference between any two letter grades. A “gap” must exist to create a grade boundary.

HOMEWORK assignments will be due on the following Thursdays:

**September 5, 12, 19, 26; October 10, 24, 31; November 14**

Late homework will be accepted until noon on the Friday following the original due date. Homework will be graded on an “all or nothing” basis. If a paper shows an answer to each assigned exercise that uses approximately the correct method, the grade for the assignment is 15 points. If any exercise is unacceptable, the paper will be returned with no points awarded. Completions of returned assignments will be accepted for full credit until noon on the Friday after the assignment is returned to the class.

An EXAM will be given on each of the following dates:

**Thursday, October 3 and Thursday, November 21**

Each exam will cover the material presented up to and including the preceding homework assignment. Points will be assigned to each section of the exam. Partial credit will be awarded according to work shown. No re-takes will be allowed. No make-up exam will be given.

A PROJECT will be due in two parts on the following dates:

**Part I – Thursday, November 7**

**Part II – Tuesday, December 3**

The project will involve development and validation of a computer simulation model. For this project, you will work with an assigned partner. The project assignment will be distributed about five weeks in advance of the Part I due date.

Your team's system description and model layout will be due on **Tuesday, October 22**.

A Peer Review of another team's system description will be due on **Tuesday, October 29**.

The FINAL EXAM is scheduled for **Thursday, December 12 at 2:00-4:00**. It will be comprehensive and will be graded similarly to the other exams. A student may elect to omit the final exam, if both exams and the project have been completed.

Reading Assignments:

Week	Topic	Text Sections
1	Discrete Event Systems Queuing Systems Terms & Definitions	1.1 – 1.3, 2.1 – 2.2, Handout
2	Simulation Models Input Analysis	2.3, 3.1 – 3.5, 4.1 – 4.3
3	Uniform Random Numbers	4.4
4	Random Numbers from Other Distributions	4.5
5	Computer Simulation Software Introduction to Arena	5.1 – 5.2
6	Exam	
7	Work Breakdown Structure (Project Management) Arena (continued)	Arena Reader
8	Model Performance Measures Statistical Inference Review	6.1-6.3, 6.6 – 6.8,
9	Model Verification and Validation Output Analysis for Terminating Simulations Output Analysis for Steady-State Simulations Project Peer Reviews	6.11.1 – 6.11.2 6.4, 6.9, 6.5, 6.10
10	Simulation Experiments Inventory Systems Terms & Definitions	6.11.3 Handout

## Reading Assignments (continued):

Week	Topic	Text Sections
11	Two-Factor Simulation Experiments	Handout
12	Project discussions Capacity Schedules and Failures	Handout
13	Exam	
14	Non-Stationary Poisson Processes	Arena Reader
15	Routes, Stations, and 2-D Animation in Arena	Arena Reader

### Academic Conduct:

Plagiarism – presenting someone else’s ideas as your own, either verbatim or recast in your own words – is a serious academic offense with serious consequences. Please familiarize yourself with the discussion of plagiarism in *SCampus* in Part B, Section 11, “Behavior Violating University Standards” <https://policy.usc.edu/scampus-part-b/>. Other forms of academic dishonesty are equally unacceptable. See additional information in *SCampus* and university policies on scientific misconduct, <http://policy.usc.edu/scientific-misconduct>.

### Support Systems:

*The Office of Disability Services and Programs*

Provides certification for students with disabilities and helps arrange relevant accommodations.

<http://dsp.usc.edu>

*Student Counseling Services (SCS) - (213) 740-7711 – 24/7 on call*

Free and confidential mental health treatment for students, including short-term psychotherapy, group counseling, stress fitness workshops, and crisis intervention. <https://engemannshc.usc.edu/counseling/>

*National Suicide Prevention Lifeline - 1-800-273-8255*

Provides free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week. <http://www.suicidepreventionlifeline.org>

*Relationship and Sexual Violence Prevention Services (RSVP) - (213) 740-4900 - 24/7 on call*

Free and confidential therapy services, workshops, and training for situations related to gender-based harm.

<https://engemannshc.usc.edu/rsvp/>

*Sexual Assault Resource Center*

For more information about how to get help or help a survivor, rights, reporting options, and additional resources, visit the website: <http://sarc.usc.edu/>

*Office of Equity and Diversity (OED)/Title IX Compliance – (213) 740-5086*

Works with faculty, staff, visitors, applicants, and students around issues of protected class.

<https://equity.usc.edu/>

*Bias Assessment Response and Support*

Incidents of bias, hate crimes and microaggressions need to be reported allowing for appropriate investigation and response. <https://studentaffairs.usc.edu/bias-assessment-response-support/>

*Student Support and Advocacy – (213) 821-4710*

Assists students and families in resolving complex issues adversely affecting their success as a student EX: personal, financial, and academic. <https://studentaffairs.usc.edu/ssa/>

*Diversity at USC*

Information on events, programs and training, the Diversity Task Force (including representatives for each school), chronology, participation, and various resources for students. <https://diversity.usc.edu/>

*USC Emergency Information*

Provides safety and other updates, including ways in which instruction will be continued if an officially declared emergency makes travel to campus infeasible, <http://emergency.usc.edu>

*USC Department of Public Safety – 213-740-4321 (UPC) and 323-442-1000 (HSC) for 24-hour emergency assistance or to report a crime.*

Provides overall safety to USC community. <http://dps.usc.edu>