IE 305 - Simulation
Spring 2023

Instructor

Ezgi Karabulut Türkseven
Office: FENS 1063
E-mail: ezgi.turkseven@sabanciuniv.edu

Teaching / Learning Assistants

Mert Özçelik   ozcelikmert@sabanciuniv.edu
Defne Yesin   sevimdefne@sabanciuniv.edu

Office hours: TBA

Office hours: TBA

Course Logistics

	Section	Time - Location
Lecture	A	T 10.40 - 11.30 *(FENS G032)* R 12.40 - 14.30 *(FENS L045)*
Recitation	A	M 12.40 - 14.30 *(FASS 2119/2128)*
	B	M 16.40 - 18.30 *(FASS 2119/2128)*

Lecture Zoom Link - *https://sabanciuniv.zoom.us/j/97061947041*

Recitation Zoom Link - *https://sabanciuniv.zoom.us/j/95921835152*

Course Description & Learning Outcomes

By the end of the semester, the students will learn:

- Principles of modeling, simulation, and analysis for discrete event systems.
- Techniques and tools to perform statistical analysis of both input and output data.
- The simulation software package Arena to build the simulation model

Textbooks

Simulation with Arena, W. David Kelton, Randall P. Sadowski, and David T. Sturrock, McGraw-Hill *(preferably 6th edition)*

Discrete-event System Simulation, Jerry Banks, John Carson, Barry L. Nelson and David Nicol, Prentice Hall *(preferably 2nd edition)*

Softwares

Arena is the main software package for this class. Instructions for how to install Arena will be posted on SuCourse.

Event-Based Simulation and Input/Output Analysis computations will be performed using **Python**. The students are allowed to choose their software/environment to run their Python codes.

Tentative Outline

1. Introduction to Simulation
2. Event Based Simulation
3. Probability Review
4. A Guided Tour Through Arena
5. Modeling Basic Operations
6. Statistics Review
7. Input Analysis
8. Generating Random Numbers and Random Variates
9. Modeling Detailed Operations
10. Output Analysis

Course Assessment Measures

~~We may have to revise the course plan according to the reassessment to be made country-wide, regarding higher education, at the beginning of April. The method of course delivery and the assessment methods are subject to change.~~

▸ ~~**Exams** (35% each): There will be two exams in total, both of which will cover the previous half of the semester approximately. Both are planned to take place physically. Please see below for the makeup exam policies.~~

▸ **Final Exam** (50%): There will be one comprehensive final exam, planned to take place physically. Please see below for the makeup exam policies.

▸ ~~**In-Class Quizzes** (5%): In-class quizzes are designed to be relatively short pop-quizzes (unannounced) given during class time. There will be a total of 2-3 quizzes. These quizzes will start at April, hence the mode of delivery (physical or online) will be determined after the general announcement.~~

▸ **In-Class Quizzes** (20%): In-class quizzes will be given during class time, and the date and topic of the quiz will be announced. There will be a total of 4-5 quizzes. The quizzes will be online and available on SuCourse. The lowest quiz grade at the end of the semester will be dropped. There will not be any make-up quizzes.

▸ **Recitation Quizzes** (10%): The recitation quizzes will be simple and short quizzes, testing the students' attendance and participation during the recitation. There will be a recitation quiz at the end of almost all recitations. The lowest quiz grade at the end of the semester will be dropped. There will not be any make-up quizzes.

- ▸ **Project** ~~(15%)~~ (20%): At the end of the semester, the students will complete a simulation project. It will include multiple topics we have covered in class: input analysis, computer simulation, output analysis. The students are expected to work in groups. The project will have multiple phases, all due towards the end of the semester. Further details of the project will be announced mid-semester.

The letter grades will be adjusted based on the performance of the class. Tentative cut-off points for the letter grades will be announced after the exams.

Course Policies

- ▸ **Laptops:** The students are expected to use their laptops in class and in recitations throughout the semester. *(Make sure you have a laptop available with you when you come to class.)*

- ▸ **Make-up:** There will be only one make-up exam, which will take place during the finals week. The students need to provide an excuse (within the next 3 days after the exam) to be eligible to take the make-up exam.

Academic Integrity

By taking this course, each student agrees to abide by the academic integrity policy at Sabanci University. Violators of academic integrity will be subject to disciplinary action.