IE 305 - Simulation
Spring 2021

Instructor

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Office hours: M 10.00 - 12.00

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Course Logistics

	Section	Time
Lecture	A	T 10.40 - 12.30 R 10.40 - 11.30
	B	T 14.40 - 16.30 R 11.40 - 12.30
Lab	A	M 13.40 - 15.30
	B	M 15.40 - 17.30

Zoom Link - *https://sabanciuniv.zoom.us/my/ezgi.turkseven* *(temporary)*

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 can be found at: https://mysu.sabanciuniv.edu/it/en/software/arena

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

▸ **Exams** (20% each): There will be three exams in total, all of which will cover the previous 4-5 weeks approximately. The **tentative** dates for the first two exams are **March 30th** and **May 4th**. The last exam will take place during the finals week. Please see below for the exam policies.

▸ **In-class quizzes** (10%): In-class quizzes are designed to be relatively short pop-quizzes (unannounced) given during class time. There will be tentatively 4-5 in-class quizzes during the semester. The lowest in-class quiz grade at the end of the semester will be dropped. There will not be any make-up quizzes.

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

▸ **Project** (15%): 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.

▸ **Participation & Attendance** (5%): Attendance information will be retrieved through Zoom logs. However, the students are also encouraged to actively participate by asking questions during class and lab time or attending office hours.

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

- ▸ **Class recordings:** Video recording of the live lectures, the slides used in the lectures, and the exercises used in the labs will be posted. However, lab sessions will not be recorded.

- ▸ **Lab quizzes:** The students are expected to attend the labs in order to be allowed to take the lab quizzes. During the lab sessions and the quizzes, the students should have their cameras on.

- ▸ **Exams:** The exams will take place during Zoom sessions. The students are expected to have their cameras on. The exam sessions will be recorded. In the following days after the exam, the students will randomly be selected for oral interviews to validate the authenticity of the answers submitted.

- ▸ **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.