IE 313: Operations Research III
Spring 2023

Instructor: Baris Balcioglu   **Office Hours:** by appointment
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Lectures: Section A: Tuesday: 10.40-11.30 in FENS L045
                    Thursday: 12.40-14.30 in FASS G062
Zoom link (for both classes and recitations):
https://sabanciuniv.zoom.us/j/93077927219?pwd=MFVvTkRRUHdpMlFvR1VmcE5sZ1NOQT
09
Meeting ID: 930 7792 7219
Pass code: susu2020

Recitations:
A Monday 13.40-14.30 FENS L065 by İpek Tanıl (ipek.tanil@sabanciuniv.edu)
B Monday 14.40-15.30 FENS L065 by İpek Tanıl (ipek_tanil@sabanciuniv.edu)
C Monday 15.40-16.30 FENS L065 by Khosro Parviz Naderi Varandi
(khosro.naderi@sabanciuniv.edu)
D Monday 16.40-17.30 FENS L065 by Deniz Tuncer (dtuncer@sabanciuniv.edu)

Course Description: The mission of this course is to continue the study of modeling and solution of decision problems using operations research techniques with a particular emphasis on stochastic aspects.

Recommended Text Book *Introduction to Stochastic Processes with R*., Robert P. Dobrow, 1st Ed., Wiley. **(Available as E Book at the IC) https://risc01.sabanciuniv.edu/record=b2733539**

Grading

Python Assignment-I	5% (for the weekend of April 15, to be handed in at most 48 hours)
Take-home Midterm	20% (May 4, 18.40- until 21.40, the maximum)
Python Assignment-II	5% (for the weekend of May 20, to be handed in at most 48 hours)
In-class Final Exam	70%
In-class make-up exam	(After the final exam, comprehensive for both the midterm and the final exam)

Important Rules:

1. No makeup for missed Assignments.
2. You have to have a valid reason for not taking an exam. If a proof such as a medical report is not brought to me <u>before or within the first three days of the exams you will</u>

NOT be given a make-up exam and will be assumed to score 0 in the exam you have missed.

3. Be respectful to your TA's! The professor will deal with the objection hours.

Topics to be covered with tentative schedule:

1. Discrete time Markov chains (Weeks 1 to 7)
   a. Definitions, classification of the states, probability transition matrix
   b. Modeling, stationary case, the limiting distribution
   c. Absorbing Markov chains
2. Continuous time Markov chains (Week 8)
   a. Modeling,
   b. Stationary case, the limiting distribution
3. Poisson Process Weeks (9-10)
   a. Exponential distribution
   b. Counting processes,
4. Queueing models based on the birth-and-death process (Weeks 11-12)
   a. Introduction
   b. M/M/c queue and its variations
5. Modeling in Python (All weeks)

Computational Part

1. Install Anaconda (https://www.anaconda.com/products/individual-d). You can follow the guide uploaded to SU Course.
2. OR Install Spyder following the download link at https://www.spyder-ide.org/