IE 313: Operations Research III  
Fall 2023

**Instructor:** Baris Balcioglu  
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**Office Hours:** by appointment

**Note:** Will be revised once the midterm date is announced by the Faculty!

**Lectures: Section A:**  
Tuesday: 14.40-16.30 in FENS L045  
Thursday: 13.40-14.30 in FENS L045

**Recitations:**  
A Friday 8.40-9.30 FENS L027 by Soner Aydın (soner.aydin@sabanciuniv.edu)  
B Friday 9.40-10.30 FENS L027 by Raci Berk İslim (berk.islim@sabanciuniv.edu)  
C Friday 12.40-13.30 FASS 1080 by Perit Hakkı Kurmel (peritk@sabanciuniv.edu)  
D Friday 13.40-14.30 FASS 1080 by Perit Hakkı Kurmel (peritk@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.

*(Available as E Book at the IC)*  
https://risc01.sabanciuniv.edu/record=b2733539

**Grading**  
Midterm 45% (to be announced, DO NOT make any travel plans)  
Final Exam 55%

**Important Rules:**

1. 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 before or within the first three days of the exams you will NOT be given a make-up exam and will be assumed to score 0 in the exam you have missed. The make-up exams may need be scheduled after the final exam and it may be comprehensive.

2. 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. EITHER Install Anaconda. You can follow the guide uploaded to SU Course.
2. OR Install Spyder following the download link at https://www.spyder-ide.org/