# IE 313: Operations Research III
## Spring 2024


**Instructor:** Baris Balcioglu          **Office Hours:** by appointment
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**Lectures: Section A**: Tuesday: 10.40-11.30 in FASS G062
                    Thursday: 12.40-14.30 in FASS G062


**Recitations:**
A Monday 13.40-14.30 FENS L065 by Aydın Can Gökşen (aydincan@sabanciuniv.edu)
B Monday 14.40-15.30 FENS L065 by Deniz Ali Turan (denizturan@sabanciuniv.edu)
C Monday 15.40-16.30 FENS L065 by Pınar Gül (pinargul@sabanciuniv.edu)
D Monday 16.40-17.30 FENS L065 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.

**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**
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|---|---|
| Midterm | 45% (April 27, starts at 10.30) |
| Final Exam | 55% (comprehensive) |


**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 <u>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.</u> The make-up exams <u>may</u> need be scheduled after the final exam and it <u>may</u> 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/