

**IE 313: Operations Research III**  
**Fall 2022**

**Instructor:** Baris Balcioglu

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**Office Hours:** by appointment

**Lectures: Section A:** Tuesday: 16.40-17.30 in FENS L045

Thursday: 12.40-14.30 in FMAN 1099

**Recitations:**

A Thursday 16.40-17.30 FENS L027 by Sina Shahri Majarshin ([ssina@sabanciuniv.edu](mailto:ssina@sabanciuniv.edu))

B Thursday 17.40-18.30 FENS L027 by Sina Shahri Majarshin ([ssina@sabanciuniv.edu](mailto:ssina@sabanciuniv.edu))

C Friday 14.40-15.30 FENS G032 by Melis Gürdağ ([melisgurdag@sabanciuniv.edu](mailto:melisgurdag@sabanciuniv.edu))

Additional TA: Deniz Tuncer ([dtuncer@sabanciuniv.edu](mailto: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)

**Grading**

Midterm 1 30% (Nov. 10, 2022 starting at 19.40)

Midterm 2 30% (Dec. 15, 2022 starting at 19.40)

Final Exam 40%

**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. Install Anaconda (<https://www.anaconda.com/products/individual-d>). You can follow the guide uploaded to SU Course.