



## Faculty of Eng. & Natural Sci.

IE312-202002

### Operations Research II

#### Instructor(s)

Name	Email	Office	Phone	Web	Office Hours
Tonguç Ünlüyurt	tonguc@sabanciuniv.edu	FENS-1056	9504	<a href="http://myweb.sabanciuniv.edu/tonguc/">http://myweb.sabanciuniv.edu/tonguc/</a>	Tuesday 15:00-17:00

#### Course Content

Develop a broad perspective on the relationships between various types of optimization problems; acquire modeling and solution skills for various methodologies: integer programming, network flows, dynamic programming, heuristics; apply these skills to problems from domains such as service, production, transportation, and energy systems.

#### Objectives

To teach basic ingredients of deterministic optimization including integer programming modeling and solution methods, network models, dynamic programming and heuristics

#### Recommend or Required Reading

**Textbook**

## Assessment Methods and Criteria

	Percentage(%)	Number of assessment methods
Final	40	
Midterm	50	2
Participation	10	

## Course Outline

- Integer programming modeling.
- Branch and bound method.
- Introduction to networks.
- Shortest path, maximum flow and minimum cost network flow problems
- Characteristics of dynamic programming
- Dynamic programming examples
- Heuristic algorithms.
- Local search and metaheuristic algorithms.
- Overview and classification of optimization problems.

## Learning Outcomes

Have a basic understanding of integer programming modeling and branch and bound algorithm as a solution method.

Have an understanding of basic concepts related to networks, network models including shortest path, maximum flow and minimum cost network flow problems  
Have an understanding of dynamic programming  
Have an understanding of heuristic approaches  
Be able to implement developed models and/or solution methods using appropriate software

## Course Policies

### Zoom Links:

Tuesday Lecture: <https://sabanciuniv.zoom.us/j/95831038754>

Thursday Lecture: <https://sabanciuniv.zoom.us/j/97474954188>

Office Hours: <https://sabanciuniv.zoom.us/j/94537867035>

In the computer-based lectures, we will use Gurobi/Python to implement the models/algorithms.

There will be two m midterms and a final. There will a single comprehensive make up exam for those of you who miss an exam.

There will be short quizzes in some lectures (max 5 minutes). The participation grade will be based on the attendance to and results of the quizzes.

For the midterm and final exams, your webcam should be on during the exam. In the case of non-compliance with this and other declared exam procedures, your exam will be void. Make sure to check that your webcam and microphone function properly before the exam.

You must attend the synchronous Zoom lectures, recitations, etc. and real-time online exams with your SU email account