Faculty of Eng. & Natural Sci.

IE312-202202

Operations Research II

Instructor(s)

Name	Email	Office	Phone	Web	Office Hours
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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

Operations Research, Applications and Algorithms
Wayne L. Winston

Assessment Methods and Criteria

	Percentage(%)	Number of assessment methods
Final	70	
Midterm	30	1
Quiz		0

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

We will use Gurobi/Python to implement the models/algorithms in the computer-based lectures.
There will be implementation questions in some exams.

There will be two midterms and a final. There will be a comprehensive makeup exam for those of you who miss an exam.

Depending on policies announced by the university, the number of exams and their weights may change. If there is any such change, the consequences will be announced giving you sufficient time to adapt.