School of Engineering and Natural Sciences / Industrial Engineering (English)

2023 - 2024 Academic Year

DECISION ANALYSIS

Syllabus

Course Description					
Name	**Code**	**Semester**	**T+A Hour**	**Credit**	**ECTS**
DECISION ANALYSIS	IND4168120	Fall Semester	3+0	3	6

Prerequisites Courses	MODELLEME VE OPTİMİZASYONA GİRİŞ; STOKASTİK MODELLER
Recommended Elective Courses	
Language of Instruction	English
Course Level	First Cycle (Bachelor's Degree)
Course Type	Elective
Course Coordinator	Assoc.Prof. Melis Almula KARADAYI
Name of Lecturer(s)	Assoc.Prof. Melis Almula KARADAYI
Assistant(s)	Res.Asst.Ahmed Arif ŞENGİL (aasengil@medipol.edu.tr)
Aim	Major objectives of this course include; • Training students to apply statistical models at intermediate level to solve relevant real-world Decision Making problems. • Developing a sense of critical thinking and providing a comprehension of modeling and rational approaches to decision making. • Developing analytical skills in structuring and analysis of decision making problems.• Understanding the use and limitations of mathematics (probability) theory to find solutions to real world problems.
Course Content	This course contains; Overview of the Course, Introduction to Decision Analysis and Decision Making,Analytic Hierarchy Process,TOPSIS METHOD,VIKOR METHOD,INTRODUCTION TO DECISION ANALYSIS,DECISION TREES and EXPECTED MONETARY VALUE ,RISK PROFILES and DOMINANCE,MAKING DECISIONS WITH MULTIPLE OBJECTIVES ,DECISION MAKING UNDER UNCERTAINTY I,DECISION MAKING UNDER UNCERTAINTY II,Value of information: Value of perfect information,Value of information: Value of imperfect information,TERM PROJECT PRESENTATIONS I,TERM PROJECT PRESENTATIONS II.

Course Learning Outcomes	**Teaching Methods**	**Assessment Methods**
Identifies the best decision alternative by evaluating expectations and risk analysis results simultaneously.	12, 16, 9	A, D, E, G
Identifies the modelling steps in decision theory and recognizes the related basic concepts.	16, 9	A, E, G
Performs structural modeling of decision problems with the help of decision trees.	12, 9	A, E, G
Substitutes the preferences of decision maker into the decision problem and compares the results due to these objective /subjective preferences.	12, 9	A, G
Examines and finalises a real world decision problem by applying all stages that take place in a decision process.	14, 9	F

Teaching Methods	12: Problem Solving Method, 14: Self Study Method, 16: Question - Answer Technique, 9: Lecture Method
Assessment Methods	A: Traditional Written Exam, D: Oral Exam, E: Homework, F: Project Task, G: Quiz

Lecture Schedule

Sequence	**Topics**	**Preliminary Preparation**
1	Overview of the Course, Introduction to Decision Analysis and Decision Making	Lecture Notes
2	Analytic Hierarchy Process	Lecture Notes
3	TOPSIS METHOD	Lecture Notes
4	VIKOR METHOD	Lecture Notes
5	INTRODUCTION TO DECISION ANALYSIS	Lecture Notes
6	DECISION TREES and EXPECTED MONETARY VALUE	Lecture Notes
7	RISK PROFILES and DOMINANCE	Lecture Notes
8	MAKING DECISIONS WITH MULTIPLE OBJECTIVES	Lecture Notes
9	DECISION MAKING UNDER UNCERTAINTY I	Lecture Notes
10	DECISION MAKING UNDER UNCERTAINTY II	Lecture Notes
11	Value of information: Value of perfect information	Lecture Notes
12	Value of information: Value of imperfect information	Lecture Notes
13	TERM PROJECT PRESENTATIONS I	
14	TERM PROJECT PRESENTATIONS II	

Evaluation Methods	**Weight(%)**
Midterm Exam	30
General Exam	70

Resources

Making Hard Decisions: An Introduction to Decision Analysis by Robert T. Clemen& T. Reilly South –Western Cengage Learning Academic Press. ISBN 0-495-01508

W. L. Winston, Operations Research: Applications and Algorithms, Thompson Brooks/Cole, 2004.

H. A. Taha, Operations Research: An Introduction, Pearson Education, 2007.