

**ABDULLAH GÜL UNIVERSITY
GRADUATE SCHOOL OF ENGINEERING & SCIENCE
INDUSTRIAL ENGINEERING DEPARTMENT
COURSE DESCRIPTION AND APPLICATION INFORMATION**

Course Name	Code	Semester	T+P (Hour)	Credit	ECTS
Decision Making in Healthcare	IE 524	Fall - Spring	3 + 0	3	10

Prerequisites

Course Type	Elective
Course Language	English
Course Coordinator	Asst. Prof. Muhammed Sütçü
Course Instructor	Asst. Prof. Muhammed Sütçü
Course Assistant	-
Course Objective	-
Course Learning Outcomes	<ol style="list-style-type: none"> 1. Ability to define solutions of the problems in the healthcare field and to develop insights on analytical solutions in the field. 2. Ability to interpret problems defined in the healthcare field and to translate the problems into mathematical language by selecting appropriate variables, parameters, objective function and constraints. 3. Ability to answer of Which type of health problems can be resolved by what kind of decision analysis methods. 4. Ability to interpret the results of the solution of the healthcare problems 5. The ability to support healthcare management and clinical decision processes with quantitative methods 6. The ability to analyze health data accurately and to support the obtained parameters with decision-making methods 7. The ability to use medical resources effectively through medical decision-making and problem-solving methods
Course Content	Decision analysis solution methods, Operations management in health systems, The application of Operations Research techniques in a project applied to healthcare systems, Multi-objective decision making, Multi-criteria decision making, information theory, AHP, ANP

WEEKLY SUBJECTS AND RELATED PRELIMINARY PREPARATION PAGES

Week	Subjects	Preliminary
1	Decision analysis methods and applications	
2	Multi-objective decision making methods	
3	Multi-objective decision making methods	
4	Operations management in Healthcare systems	
5	Demand Forecasting in Healthcare systems	
6	Decision Making Process and Mathematical Modeling	
7	Macro Planning of Healthcare services	
8	Midterm Exam	
9	Queuing Theory in Healthcare Systems	
10	Markov Decision Process Applications in Healthcare Systems	
11	Statistical Process Control in Healthcare Systems	
12	Analytical Hierarchical Process	
13	Information Theory applications in Healthcare Systems, Entropy, Maximum Entropy, mutual information	
14	Project Presentation	
15	Final Exam	

SOURCES

Lecture Notes	Lecture notes and slides of the course will be shared with students during the semester via CANVAS system.
Other Sources	No required textbook. Academic Papers will be shared throughout the course weekly. Recommended Textbook: Ronal A. Howard, Ali E. Abbas, Foundations of Decision Analysis, Pearson, 2015,

MATERIAL SHARING	
Documents	will be shared with students during the semester via CANVAS system.
Homework	will be shared with students during the semester via CANVAS system.
Exams	1 (one) midterm exam and 1 (one) final exam. 2 exams in total

DEĞERLENDİRME SİSTEMİ		
ACTIVITIES	QUANTITY	WEIGHT
Midterm Exam	1	%40
Quiz	5	%30
Homework	5	%30
TOTAL		%100
Term Activities Percentage		%70
Final Exam Percentage		%30
TOTAL		%100

Course Category	
Natural Sciences and Mathematics	%10
Engineering Sciences	%80
Social Sciences	%10

DERSİN ÖĞRENİM ÇIKTILARININ PROGRAM YETERLİLİKLERİ İLE İLİŞKİSİ						
No	Program Qualification	Contribution Level				
		1	2	3	4	5
1	PQ1.					X
2	PQ2.				X	
3	PQ3.					X
4	PQ4.				X	
5	PQ5.				X	
6	PQ6.					X

*Increasing from 1 to 5.

ECTS / WORK LOAD TABLE			
Activities	Activity	Duration (Hour)	Total Work Load
Course Duration (including exam week: 16x total course hours)		3	48
Out-of-class Study Time (Pre-study, practice)		3	48
Reading		5	80
Internet browsing, library work		2	32
Report Preparation		10	20
Presentation Preparation		5	10
Presentation		1	2
Homework		5	25
Midterm Exam		20	20
Final Exam		25	25
Total Work Load			310
Total Work Load / 30			10.33
Course ECTS CREDIT			10