ÇANKAYA UNIVERSITY
Department of Industrial Engineering

IE 512 – Decision Analysis
Spring 2026

Instructor:

Selcen Phelps, PhD, MBA, MA
E-mail: ???
Office: L309

Course Schedule:

Wednesday 18:00- 20:50 (Balgat Campus A-309)

Office Hours:

Mondays 14:00 - 15:00
Tuesdays 11:00 – 12:00
(phone ???
I will be happy to meet you online via Zoom)

Textbook:

Making Hard Decisions with Decision Tools, 3rd Ed., Clemen, R. T. and Reilly T., Cengage, 2014
Available from Palme Kitapevi
(*An older edition is in the library:* HD30.23.C577C54 2001 C.1).

Software:

Decision Tools Suite, from Palisade/Lumivero
Once you have purchased the book, go to the site
https://lumivero.com/resources/book-downloads/cengage-book-downloads/
and fill out the form.

Reference Books:

Decision Analysis, Raiffa H., Addison-Wesley, 1968.
Decision Analysis for Management Judgement, Goodwin P. and Wright G., Wiley, 1999 (HD 30.23 G66).
Decision Making Under Uncertainty, Holloway, C. A., Prentice-Hall, 1979.
Decisions with Multiple Objectives, Keeney, R.L. and Raiffa, H., Wiley, 1976 (T57.95K44 1993).
An Introduction to Bayesian Inference and Decision, Winkler R. L., Probabilistic Publishing, 2003 (QA279.5W56 2003 C.2).

Course Description:

Fundamentals of decision analysis. Conflicting objectives. Decision making problems under certainty and uncertainty. Decision trees and Bayesian decision making. Risk preference of decision makers. Utility functions. The cases of single-attributes and multi-attributes. Individual versus group decisions.

Course Objectives:

The ability to make good decisions is a fundamental skill for engineers and managers in any organization. This course aims to help you to make better decisions by teaching you the

techniques to deal with complex and hard decisions, and by pointing out the common mistakes of intuitive decision making.

At the end of the course, the students will

1. learn engineering principals relevant to decision making,
2. appreciate the challenges when making decisions,
3. be able to identify uncertainties and multiple objectives in decision problems,
4. understand the behavioral aspects of risk attitudes and the utility theory
5. be able to structure and model real life complex decision problems,
6. be able to resolve a decision making problem using the analytical tools of decision analysis
7. communicate their choices and recommendations clearly.

Course Web Page:

A web page will be available for this course at https://webonline.cankaya.edu.tr
You will need to access this web page for announcements about class, lecture notes, and assignments. A copy of the lecture slides will be posted on Moodle at the beginning of every week. You are encouraged to use these slides as a scaffold for the notes that you take during the class.

Grading:

Assignments (3@ 5% ea)	15 %
Midterm	30 %
Project	20 %
Final Exam	35 %
Total	100 %

Attendance Policy:

Attendance will be taken every lecture hour.
As per University policy, the minimal requirement is 60% attendance. Any student falling below this limit will not be admitted to the midterm and final exams. (*Excused absences, e.g. with medical notes certified by Çankaya University's Health Center, are still counted as absences*.)
It is strongly recommended to attend all the lecture hours to understand the course material.

Classroom Policies:

Every student is expected to respect the other students' right to learn. Any behavior which distracts or disturbs the other students or the instructor, or disrupts class in any way is unacceptable and will not be tolerated.
This class is best learned through participation in classroom discussions and problem recitations. All students are expected to remain engaged, actively participate, and ask questions in order to maximize their grasp over the principles, tools, and perspectives that will be covered.
The lecture slides made available on Moodle will not contain all the discussion and examples, or the solutions of the problems covered in the class. Students are expected take notes, and review their notes as well as the slides when studying for exams or working on assignments.

Make-up Policy:

A make-up examination for the midterm and the final exam will only be given under highly unusual circumstances (such as serious health or family problems). The student should contact the instructor as early as possible and provide the instructor with proper documentation (such

as a medical note certified by Çankaya University's Health Center). A make-up exam may have a different format and may contain different type of questions than the regular exam.

Conditions that lead to the letter grade "NA":

Not attending the Midterm Exam (or its makeup) or the Final Exam (or its makeup).

Tentative Schedule:

Week	Topics	Book
1	Introduction to Decision Analysis + Elements of Decision Problems	Ch1-2
2	Structuring Decisions + Making Choices	Ch 3-4
3	Risk Analysis	Ch 4
4	Subjective Probability **Assignment1 due** *(based on Ch 2-4)*	Ch8
5	Sensitivity Analysis	Ch 5
6	Organizational Use of Decision Analysis **Assignment2 due** *(based on Ch 5)*	Ch 6
7	Theoretical Probability Models	Ch 9
8	**Midterm** *(based on Ch 1-9)*	
9	Using Data + Simulation	Ch 10-11
10	Value of Information + Real Options	Ch 12-13
11	Risk Attitudes **Assignment due** *(based on Ch 12-14)*	Ch14
12	Conflicting Objectives	Ch 16-Ch17
13	Utility Axioms, Paradoxes, and Implications	Ch15
14	**Project due + Presentations** *(Comprehensive)*	
Finals	Final *(Comprehensive)*	

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