ÇANKAYA UNIVERSITY
Department of Industrial Engineering

IE 435 – Decision Analysis

Spring 2026

Instructor:

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Office: L309

Course Schedule:

Monday 9:20- 12:10 (LA14)

Office Hours:

Mondays 13:20 - 15:10
Tuesdays 11:20 – 12:10

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 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.

Course Description:

Introduction; review of some basic concepts; structuring and developing a decision model; decision situations, screening alternatives and expected value analysis; decision tree analysis with a single objective and corresponding risk profiles; decision tree analysis with multiple

objectives and corresponding risk profiles; probabilistic and non-probabilistic criteria for decision making under uncertainty; value of information; introduction to utility theory; sensitivity analysis.

Course Objectives:

The main aims of this course are:

- to help students recognize types of problems that can be addressed using decision analysis and differentiate between risk and uncertainty,
- to develop skills in identifying decision elements,
- to introduce graphical and mathematical approaches for structuring and solving decision problems,
- to develop skills in applying decision analysis concepts and techniques to identify good decisions and strategies,
  to introduce sensitivity analysis tools that will help identify importance of parameters on the results of a decision analysis.

On successful completion of the course, all students will have developed:

1. skills in identifying decision elements, building and solving a decision model,
2. skills in identifying and dealing with uncertainty and risk in decision making.

On successful completion of the course, all students will be:

3. involved in teamwork,
4. aware of ethical issues.

Grading:

Assignments (2@10% ea)	30 %
Midterm	30 %
Final Exam	40 %
Total	100 %

Attendance Policy:

You are strongly recommended to attend all the lecture hours to understand the course material.
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 final exam. (*Excused absences, e.g. with medical notes certified by Çankaya University's Health Center, are still counted as absences*.)

Classroom Policies:

1. 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.
2. 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.
3. 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	Ch 1, 2
2	Structuring Decisions: Influence Diagrams and Decision Trees	Ch 3
3	Structuring Decisions+Making Choices	Ch 3, 4
4	Making Choices	Ch 4
5	Risk Analysis: Risk Profiles and Dominance **Assignment1 due** *(based on Ch 2-4)*	Ch 4
6	Organizational Use of Decision Analysis	Ch 6
7	**Midterm** *(based on Ch 1-4, 6)*	
8	Subjective Probability	Ch8
9	Sensitivity Analysis	Ch 5
10	Sensitivity Analysis + Value of Information	Ch 5, 12
11	Value of Information **Assignment2 due** *(based on Ch 5)*	Ch 12
12	Real Options	Ch 13
13	Risk Attitudes **Assignment3 due** *(based on Ch 12-13)*	Ch 14
14	Utility Theory	Ch 15
Finals	Final *(Comprehensive)*	