



# AK2014 Decision Theory 7.5 credits

## Beslutsteori

This is a translation of the Swedish, legally binding, course syllabus.

If the course is discontinued, students may request to be examined during the following two academic years

## Establishment

Course syllabus for AK2014 valid from Spring 2022

## Grading scale

A, B, C, D, E, FX, F

## Education cycle

Second cycle

## Main field of study

Built Environment

## Specific prerequisites

Higher education studies comprising 120 ECTS credits. Language proficiency corresponding to English B/English 6 in Swedish **gymnasium**.

## Language of instruction

The language of instruction is specified in the course offering information in the course catalogue.

## Intended learning outcomes

After completed course, the student is expected to

- be able to account for the basics of formalising decision problems, the selection of decision-theoretical method, decisions under risk and uncertainty, and the history of decision theory,
- be able to account for the basic concepts used in decision theory: uncertainty and values, the extent to which they are subject to rationality constraints, and the extent to which they may be quantified,
- be able to apply decision-theoretical theory and give reasons for selected solutions of decision problems and of game-theoretical problems,
- be able to discuss and analyse decision-theoretical questions from a philosophical perspective,
- be able to discuss and problematise decision theory and decision methods in practical academic or professional settings.

For higher grades, the student is additionally expected to

- be able to analyse and problematise formalisations of decision problems, the selection of decision-theoretical method given a certain decision problem, and decision under risk and uncertainty,
- be able to problematise concepts used in decision theory: uncertainty and values, the extent to which they are subject to rationality constraints, and the extent to which they may be quantified.

## Course contents

In many situations we are forced to make decisions without having complete knowledge of the outcomes of our choices. The aim of this course is to provide a foundation for reflection on how rational choices can be made in such situations. We will discuss concepts such as rationality, preferences, goals, uncertainty, and utility. What does it mean to say that a preference, a goal, or a choice is rational? How should decisions be made under uncertainty and risk? What importance does the expected utility of different options have in a decision situation? This course will also serve as an introduction to game theory and social decision theory.

## Examination

- DELA - Seminar Participation and Home Assignments, 3.0 credits, grading scale: P, F
- EXCA - Take-home Exercises, 4.5 credits, grading scale: P, F
- TENA - Optional Exam, - credits, grading scale: A, B, C, D, E, FX, F

Based on recommendation from KTH's coordinator for disabilities, the examiner will decide how to adapt an examination for students with documented disability.

The examiner may apply another examination format when re-examining individual students.

Students who choose not to take TENA but who passed both DELA and EXCA receive an overall grade E.

Students who pass TENA and who passed both DELA and EXCA receive the grade on TENA as their overall grade.

## **Ethical approach**

- All members of a group are responsible for the group's work.
- In any assessment, every student shall honestly disclose any help received and sources used.
- In an oral assessment, every student shall be able to present and answer questions about the entire assignment and solution.