

## Decision Theory

Beslutsteori  
6 credits

Programme course

732A66

Valid from: 2022 Autumn semester

<b>Determined by</b>	<b>Main field of study</b>	
The Quality Board at the Faculty of Arts and Sciences	Statistics	
<b>Date determined</b>	<b>Course level</b>	<b>Progressive specialisation</b>
2016-09-30	Second cycle	A1F
<b>Revised by</b>	<b>Disciplinary domain</b>	
Course and Programme Syllabus Board at the Faculty of Arts and Sciences	Technology	
<b>Revision date</b>	<b>Subject group</b>	
2022-06-15	Statistics	
<b>Offered first time</b>	<b>Offered for the last time</b>	
Autumn semester 2016		
<b>Department</b>	<b>Replaced by</b>	
Institutionen för datavetenskap		

## Course offered for

- Master's Programme in Statistics and Machine Learning

## Entry requirements

- Bachelor's degree equivalent to a Swedish Kandidatexamen of 180 ECTS credits in one of the following subjects:
  - statistics
  - mathematics
  - applied mathematics
  - computer science
  - engineering
- Completed courses in
  - calculus
  - linear algebra
  - statistics
  - machine learning
  - programming
- English corresponding to the level of English in Swedish upper secondary education (Engelska 6)  
Exemption from Swedish
- At least 30 ECTS credits passed from semester 1 and 2 Master's Programme in Statistics and Machine Learning, including the course Machine Learning 9 ECTS credits, or the equivalent

## Intended learning outcomes

After completion the course, the student should on an advanced level be able to:

- use statistical methods for decision making,
- apply the principles for subjective probability interpretation, Bayesian inference, utility theory and sequential analysis in order to make a decision,
- critical assess the presumptions for each step in a decision making process

## Course content

The course content comprises:

- The subjective interpretation of probabilities
- Probabilistic reasoning and likelihood theory,
- Bayesian hypothesis evaluation,
- Decision theoretic elements
- Utility and loss functions
- Graphical modelling as a tool for decision making
- Sequential analysis

## Teaching and working methods

Assignments encompassing both theoretical and computer-based exercises. One final oral examination.

Detailed information about the examination can be found in the course's study guide.

## Examination

Assignments encompassing both theoretical and computer-based exercises. One final oral examination.

Detailed information about the examination can be found in the course's study guide.

If special circumstances prevail, and if it is possible with consideration of the nature of the compulsory component, the examiner may decide to replace the compulsory component with another equivalent component.

If the LiU coordinator for students with disabilities has granted a student the right to an adapted examination for a written examination in an examination hall, the student has the right to it.

If the coordinator has recommended for the student an adapted examination or alternative form of examination, the examiner may grant this if the examiner assesses that it is possible, based on consideration of the course objectives.

An examiner may also decide that an adapted examination or alternative form of examination if the examiner assessed that special circumstances prevail, and the examiner assesses that it is possible while maintaining the objectives of the course.

Students failing an exam covering either the entire course or part of the course twice are entitled to have a new examiner appointed for the reexamination.

Students who have passed an examination may not retake it in order to improve their grades.

## Grades

ECTS, EC

## Other information

Planning and implementation of a course must take its starting point in the wording of the syllabus. The course evaluation included in each course must therefore take up the question how well the course agrees with the syllabus.

The course is conducted in such a way that there are equal opportunities with regard to sex, transgender identity or expression, ethnicity, religion or other belief, disability, sexual orientation and age.

If special circumstances prevail, the vice-chancellor may in a special decision specify the preconditions for temporary deviations from this course syllabus, and delegate the right to take such decisions.