

## Advanced Data Mining

Avancerad Data Mining  
6 credits

Programme course

732A75

Valid from: 2025 Spring semester

<b>Determined by</b>	<b>Main field of study</b>	
Course and Programme Syllabus Board at the Faculty of Arts and Sciences	Statistics	
<b>Date determined</b>	<b>Course level</b>	<b>Progressive specialisation</b>
2018-03-20	Second cycle	A1F
<b>Revised by</b>	<b>Disciplinary domain</b>	
Chairman of the Course and Programme Syllabus Board at the Faculty of Arts and Sciences	Technology	
<b>Revision date</b>	<b>Subject group</b>	
2022-12-06; 2024-09-30	Statistics	
<b>Offered first time</b>	<b>Offered for the last time</b>	
Spring semester 2018		
<b>Department</b>	<b>Replaced by</b>	
Institutionen för datavetenskap		

## Course offered for

- Master's Programme in Statistics and Machine Learning

## Entry requirements

- 180 ECTS credits passed including 90 ECTS credits in one of the following subjects:
  - statistics
  - mathematics
  - applied mathematics
  - computer science
  - engineering
- Passed courses in:
  - calculus
  - linear algebra
  - statistics
  - programming
- Passed Advanced Academic Studies, 3 ECTS credits

## Intended learning outcomes

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

- apply the terminology used in unsupervised learning
- account for applications in which clustering and association analysis are relevant
- account for the algorithms used in clustering and association analysis
- apply cluster analysis in order to perform outlier analysis
- utilize an appropriate software for cluster and association analysis and interpret the obtained outcome

## Course content

The course deals with:

Association analysis: concepts and methods related to frequent item sets and association rules such as Apriori principle, FP-growth, evaluation of association rules.

Cluster analysis: concepts and methods related to partitional clustering methods, hierarchical clustering methods, density-based clustering methods, cluster evaluation, outlier analysis.

## Teaching and working methods

The teaching comprises lectures, computer laboratory and seminars. Homework and independent study are a necessary complement to the course. Language of instruction: English.

## Examination

The course is examined by

- written reports of laboratory assignments in groups, grade scale: EC, P/F
- individual written exam, grade scale: EC

To obtain Pass (E) as a final grade, at least grade E is required on the individual exam and Pass on the laboratory assignments. A higher grade is based on the individual written exam.

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.

### About teaching and examination language

The teaching language is presented in the Overview tab for each course. The examination language relates to the teaching language as follows:

- If teaching language is “Swedish”, the course as a whole could be given in Swedish, or partly, or as a whole, in English. Examination language is Swedish, but parts of the examination can be in English.
- If teaching language is “English”, the course as a whole is taught in English. Examination language is English.
- If teaching language is “Swedish/English”, the course as a whole will be taught in English if students without prior knowledge of the Swedish language participate. Examination language is Swedish or English depending on teaching language.