



# SF2957 Statistical Machine Learning 7.5 credits

## Statistisk maskininlärning

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

The course syllabus is valid from Spring 2022 according to the school principal's decision: S-2022-0529 Decision date: 2022-02-24

## Grading scale

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

## Education cycle

Second cycle

## Main field of study

Mathematics

## Specific prerequisites

- English B / English 6
- Completed basic course in numerical analysis (SF1544, SF1545 or equivalent)
- Completed basic course in probability theory and statistics (SF1922, SF1914 or equivalent)
- Completed advanced course in probability theory (SF2940 or equivalent)

## Language of instruction

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

## Intended learning outcomes

After completion of the course, the student shall be able to:

- formulate and apply statistical decision theory
- formulate and apply advanced methods in statistical machine learning
- design and implement advanced methods in statistical machine learning for applications

## Course contents

This course presents an overview of advanced methods of statistical machine learning. Topics covered include classical and Bayesian decision theory, deep learning for regression and classification, Gaussian processes for regression and classification, clustering, reproducing kernel Hilbert spaces, reinforcement learning, and computational methods in machine learning. Computer-aided projects with a variety of datasets forms an essential learning activity.

## Examination

- PRO1 - Project, 3.0 credits, grading scale: P, F
- TENA - Written exam, 4.5 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.

## 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.