



MF2516 Machine Learning in Engineering Design 3.0 credits

Maskininlärning i maskinkonstruktion

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

Establishment

The official course syllabus is valid from the autumn semester 2026 as decided by the Faculty Board decision HS-2025-2583. Date of decision: 2025-10-08

Grading scale

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

Education cycle

Second cycle

Main field of study

Mechanical Engineering

Specific prerequisites

Bachelor of Science degree in mechanical engineering or equivalent.

MF2024 Robust and Probabilistic Design, or equivalent.

Intended learning outcomes

After completing the course, students should be able to:

1. Analyze parameter sensitivity, explore parameter spaces, and interpret output data in order to extract insights from large data sets.
2. Apply large-scale data methods, big data, in the optimization of machine design to identify and evaluate opportunities for improvement.
3. Apply tools based on neural networks to facilitate the design process of machine components and systems.

Course contents

The course aims to develop students' skills in developing machine components and systems using modern machine learning methods, as well as effectively navigating, preprocessing, and analyzing large, high-dimensional technical data sets, including feature scaling. You will be trained in using the following applied to machine components and systems

- Classification and clustering algorithms for categorizing technical databases.
- Data-driven optimization algorithms
- Regression methods
- Supervised and unsupervised learning algorithms
- Neural network architectures and deep learning models

Examination

- INL1 - Hand in assignment, 2.0 credits, grading scale: P, F
- TEN1 - Written Exam, 1.0 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. If the course is discontinued, students may request to be examined during the following two academic years.

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.