



# CB206V Machine Learning in Biotechnology 7.5 credits

Maskininlärning inom bioteknik

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 CB206V valid from Autumn 2024

## Grading scale

P, F

## Education cycle

Second cycle

## Main field of study

Biotechnology

## Specific prerequisites

Completed degree project 15 credits, 20 credits in biotechnology, genomics, bio(medical) sciences, data sciences, or biostatistics, 6 credits in mathematics, and English B/6.

## 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 students shall have knowledge to:

- Explain the concepts of artificial intelligence/machine learning, including supervised and unsupervised learning, deep neural networks, and optimization.
- Apply machine learning algorithms to a range of data types and domains, including images and genomic data, to solve real-world problems related to biotechnology.
- Evaluate the performance of machine learning models using appropriate metrics and techniques, and interpret the results to draw meaningful conclusions.
- Identify ethical and societal implications of machine learning, including issues related to fairness, privacy, and accountability.
- Communicate machine learning concepts and results effectively to both technical and non-technical audiences, using appropriate visualizations and language.
- Explain how machine learning could begin to be integrated into their own research.

## Course contents

- Computational foundations
- Biological foundations
- Linear models
- Deep neural networks
- Kernel methods, trees, & forests
- Unsupervised learning
- Society, ethics, and broader impacts

## Examination

- PRO1 - Group project, 2.5 credits, grading scale: P, F
- SEM1 - Group work and seminar presentation, 1.0 credits, grading scale: P, F
- TEN1 - Oral exam, 4.0 credits, grading scale: P, 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.