



# DD2424 Deep Learning in Data Science 7.5 credits

## Djupinläring i Data Science

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 DD2424 valid from Spring 2019

## Grading scale

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

## Education cycle

Second cycle

## Main field of study

Computer Science and Engineering

## Language of instruction

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

## Intended learning outcomes

After the course, you should be able to:

- explain the basic the ideas behind learning, representation and recognition of raw data
- account for the theoretical background for the methods for deep learning that are most common in practical contexts
- identify the practical applications in different fields of data science where methods for deep learning can be efficient (with special focus on computer vision and language technology)

in order to:

- be able to solve problems connected to data representation and recognition
- be able to implement, analyse and evaluate simple systems for deep learning for automatic analysis of image and text data
- receive a broad knowledge enabling you to learn more about the area and read literature in the area

## Course contents

- Learning of representations from raw data: images and text
- Principles of supervised learning
- Elements for different methods for deep learning: convolutional networks and recurrent networks
- Theoretical knowledge of and practical experience of training networks for deep learning including optimisation using stochastic gradient descent
- New progress in methods for deep learning
- Analysis of models and representations
- Transferred learning with representations for deep learning
- Application examples of deep learning for learning of representations and recognition

## Specific prerequisites

Non-programme students: 90 university credit points including 45 credits in mathematics or informatics

## Course literature

Ian Goodfellow, Aaron Courville, and Yoshua Bengio "Deep Learning"

Material produced at the department

## Examination

- LAB1 - Laboratory work, 4.5 credits, grading scale: A, B, C, D, E, FX, F
- TEN1 - Examination, 3.0 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.

By making an optional project assignment the students can improve their final grade.

## **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.