



# FDD3432 Graduate Course in Artificial Neural Networks and Other Learning Systems 6.0 credits

Doktorandkurs i artificiella neuronnät och andra lärande system

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 FDD3432 valid from Spring 2013

## Grading scale

## Education cycle

Third cycle

## Specific prerequisites

## Language of instruction

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

## Intended learning outcomes

After the course, the students should be able to

- explain the function of artificial neural networks (ANN) of the type Back-prop, Hopfield, RBF and SOM
- explain the difference between supervised and unsupervised learning
- account for assumptions and derivations behind the ANN algorithms that are brought up in the course
- give examples of design and implementation for small problems
- implement ANN algorithms to achieve signal processing, optimisation, classification as well as process modelling

in order to

- obtain an understanding of the technical potential as well as advantages and limitations of the learning and self-organizing systems of today
- in the working life be able to apply the methodology and produce implementations.

## Course contents

The course includes algorithms that obtain their computational properties based on training on examples. You therefore avoid to state rules explicitly but work via training on measured data. The learning can either be controlled by straight reply is given or be completely autonomous. The course also goes through principles of representation of data in neural networks. We bring up hardware architectures for neural calculations (neural chips and neural computes) and show how ANN is used in robotics. We also show technical applications of learning systems in problem areas as pattern recognition, combinatorial optimisation and diagnosis.

## Course literature

Fausett, Fundamentals of Neural Networks, Prentice Hall.

## Examination

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.

In this course, the code of honor of the school is applied, see: <http://www.kth.se/en/csc/utbildning/hederskodex>

## 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.