

**SYLLABUS**

# **Applied Artificial Intelligence 7.5 credits D7041E**

**Tillämpad artificiell intelligens**

**Course syllabus admitted: Autumn 2024 Sp 1 - Present**

**DECISION DATE  
2024-02-15**

# Applied Artificial Intelligence 7.5 credits D7041E

## Tillämpad artificiell intelligens

### Second cycle, D7041E

**Education level**  
Second cycle

**Grade scale**  
G U 3 4 5

**Subject**  
Datalogi

**Subject group (SCB)**  
Computer Technology

## Entry requirements

Courses of at least 120 credits including the following knowledge: basic algorithms and data structures, programming and discrete mathematics, equivalent to the courses D0012E Algorithms and Data Structures 7.5 credits and M0009M Discrete Mathematics 7.5 credits

Good knowledge in English equivalent to English 6.

## Selection

The selection is based on 30-285 credits

## Course Aim

The course covers the concepts, models and computation methods for computer programs and systems that can autonomously, learn and generalise new knowledge and feature self-awareness.

After the course the student should be able to

- demonstrate knowledge of the disciplinary foundation and of proven experience in the design and analysis of systems built using principles of artificial intelligence
- demonstrate in-depth knowledge of methods and theories in the field of artificial intelligence
- demonstrate abilities to develop learning techniques and systems based on human needs as well as the society's goals for sustainable development
- demonstrate the ability to identify, formulate, design, and implement learning components and applications
- demonstrate the ability to critically evaluate and compare different AI models and learning algorithms for different problem setups and quality characteristics
- demonstrate the ability to model, predict and evaluate the events even with limited information

## Contents

Topics covered include: basic methodology, paradigms for artificial intelligence, learning methods and strategies including neural networks, evolutionary methods, instance-based learning, reinforcement learning. Methods for evaluating learning outcomes. Declarative languages, knowledge models, reasoning models. Agent architectures. Fuzzy sets. Cognitive decision making. Associative memory. Applications including robotics and automation.

## Realization

Each course occasion's language and form is stated and appear on the course page on Luleå University of Technology's website.

The education consists of lectures, laboratory work and a seminar assignment. The laboratories are presented orally and may be provided with a deadline for submission. There are no elective course elements. Unapproved students must retake the unsuccessful examination moment next time the course is given.

## Examination

If there is a decision on special educational support, in accordance with the Guideline Student's rights and obligations at Luleå University of Technology, an adapted or alternative form of examination can be provided. Continuous examination with laboratory work, presentations of research publications and mini-projects that give a number of points.

The mini-project is presented orally and by submitting a written report. The grade in the course is based on how many points you have accumulated.

## Unauthorized aids during exams and assessments

If a student, by using unauthorized aids, tries to mislead during an exam or when a study performance is to be assessed, disciplinary measures may be taken. The term "unauthorized aids" refers to aids that the teacher has not previously specified as permissible aids and that may assist in solving the examination task. This means that all aids not specified as permissible are prohibited. The Swedish version has interpretative precedence in the event of a conflict.

## Course offered by

Department of Computer Science, Electrical and Space Engineering

## Modules

Code	Description	Grade scale	Cr	Status	From period	Title
0005	Quiz	G U 3 4 5	2	Mandatory	A24	
0006	Mini project	G U 3 4 5	2.5	Mandatory	A24	
0007	Laboratory work	G U 3 4 5	3	Mandatory	A24	

## Last revised

by Robert Brännström 2024-02-15

# Syllabus established

by Jonny Johansson, HUL SRT 2016-06-15