

## COURSE SYLLABUS

**Building Advanced AI Systems, 7.5 credits***Konstruktion av avancerade AI-system, 7.5 högskolepoäng*


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Course Code:	T2KAAA	Education Cycle:	Second-cycle level
Confirmed:	Feb 01, 2025	Disciplinary domain:	Technology
Valid From:	Sep 01, 2025	Subject group:	Computer Technology
		Specialised in:	A1F Second cycle, has second-cycle course/s as entry requirements
		Main field of study:	Computer Science

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**Intended Learning Outcomes (ILO)**

On completion of the course the student shall:

**Knowledge and understanding**

- display knowledge of common tools and frameworks for building advanced Artificial Intelligence (AI) systems
- display knowledge of the current state-of-the-art of publicly available AI components (such as pre-trained AI models and solutions)
- display an understanding of the possibilities and limitations related to how AI components can be used as building blocks in advanced AI systems,

**Skills and abilities**

- demonstrate skills of designing AI software systems
- demonstrate skills of identifying and adapting suitable AI components for a specific problem
- demonstrate skills of developing and implementing AI systems using AI components,

**Judgement and approach**

- demonstrate sound judgement in evaluating components for inclusion in AI systems, for specific problems, regarding relevant evaluation criteria
- demonstrate sound judgement in evaluating AI systems regarding relevant evaluation criteria.

**Content**

Effective utilization of ready-to-use and state-of-the-art AI components is crucial to fully realize the potential of AI. The ability to find, evaluate and adapt available AI components suitable for solving complex tasks require knowledge and skills in both software engineering and AI/Machine Learning (ML). In this course, students will develop AI systems for real-life problems, utilizing and combining available AI components as is relevant for the chosen tasks.

The course includes the following elements:

- overview of state-of-the-art and ready-to-use AI components,
- design principles for AI components,
- combining pre-trained models, APIs, and open-source tools into larger systems,
- understanding and addressing issues like bias, fairness, transparency, and accountability in AI systems,
- best practices for scaling AI systems and optimizing performance for real-world challenges,
- strategies for deploying AI systems in production environments and monitoring their performance and ethical impact.

## Type of instruction

Lectures, workshops, and seminars.

Language of instruction is in English.

## Entry requirements

Passed courses at least 90 credits within the major subject Computer Engineering, Electrical Engineering (with relevant courses in Computer Engineering and Software Development), or equivalent, or passed courses at least 150 credits from the Computer Science and Engineering programme, and taken courses in Artificial Intelligence, 7,5 credits, Machine Learning, 7,5 credits and Deep Learning, 7,5 credits or equivalent. Proof of English proficiency is required.

## Examination and grades

The course is graded 5, 4, 3 or U.

Registration of examination:

Name of the Test	Value	Grading
Project <sup>1</sup>	5 credits	5/4/3/U
Seminar	2.5 credits	G/U

<sup>1</sup>Determines the final grade of the course, which is issued only when all course units have been passed.

## Course literature

Please note that changes may be made to the reading list up until eight weeks before the start of the course.