Faculty of Health, Science and Technology
Computer Science

Syllabus

AI Engineering

Course Code:	DVAE26
Course Title:	AI Engineering *Tekniker för AI*
Credits:	7.5
Degree Level:	Master's level
Progressive Specialisation:	Second cycle, has second-cycle course/s as entry requirements (A1F)

Major Field of Study:
DVA (Computer Science)

Course Approval
The syllabus was approved by the Faculty of Health, Science and Technology 2026-01-27, and is valid from the Autumn semester 2026 at Karlstad University.

Prerequisites
Upper secondary level English 6 or English level 2, or equivalent. Foundations of AI and optimisation methods (7.5 credits) and Distributed systems and cloud computing (7.5 credits). Equivalence assessment may be made.

Learning Outcomes
Upon completion of the course, students should be able to:
- explain basic concepts of software engineering that are applicable in AI engineering,
- identify challenges of creating systems that rely on AI,
- explain how AI components are part of large systems,
- explain the steps and areas of responsibility in a standard machine learning process in production, and the challenges involved,
- implement development strategies for ML models and explain how these are made usable for end users,
- explain concepts behind machine learning operations (MLOps) and automated workflows, and
- design and implement strategies for continuous integration (CI) and continuous delivery (CD) of ML models in accordance with current MLOps best practices for keeping a production system going.

Content
The course focuses on challenges and concepts related to software engineering aspects of systems based on artificial intelligence. The course offers knowledge and support for students to be able to implement AI systems successfully, and covers the life cycle of AI systems from the perspective of software engineering in terms of requirements management, design, implementation, testing, and maintenance. The course also explains implementation problems in the workflow of an ML system in production, including continuous integration (CI) and continuous delivery (CD) for ML models, and covers issues related to machine learning operations (MLOps), suitable ways of creating integrated systems, and the architectural considerations required for roll-out systems, including quality assurance (QA) of MLOps for those systems.

Reading List
See separate document.

Examination
Assessment is based on individual hand-in assignments, laboratory work presented in written reports, a final project, and an individual oral exam.

If students have a decision from Karlstad University entitling them to Targeted Study Support due to a documented disability, the examiner has the right to give such students an adapted examination or to examine them in a different manner.

Grades
One of the grades 5 (Pass with Distinction), 4 (Pass with Some Distinction), 3 (Pass), or U (Fail) is awarded in the examination of the course.

Quality Assurance
Follow-up relating to learning conditions and goal-fulfilment takes place both during and upon completion of the course in order to ensure continuous improvement. Course evaluation is partly based on student views and experiences obtained in accordance with current regulations and partly on other data and documentation. Students will be informed of the result of the evaluation and of any measures to be taken.

Course Certificate
A course certificate will be provided upon request.

Additional information
The local regulations for studies at the Bachelor and Master levels at Karlstad University stipulate the obligations and rights of students and staff.