

COURSE SYLLABUS

Intelligent Automation Systems, 7.5 credits

Intelligent automationssystem, 7.5 högskolepoäng

Course Code:	T2IAKC	Education Cycle:	Second-cycle level
Confirmed:	Sep 01, 2025	Disciplinary domain:	Technology
Valid From:	Aug 30, 2027	Subject group:	Mechanical Engineering
		Specialised in:	A1F Second cycle, has second-cycle course/s as entry requirements
		Main field of study:	Production Systems

Intended Learning Outcomes (ILO)

On completion of the course the student shall:

Knowledge and understanding

- demonstrate comprehension of machine learning principles and artificial intelligence techniques for automation applications
- show familiarity with intelligent pattern recognition methods for industrial data
- demonstrate comprehension of adaptive learning systems in production environments

Skills and abilities

- demonstrate the ability to develop machine learning solutions for automation systems
- demonstrate skills in implementing intelligent data analysis systems for industrial monitoring
- demonstrate the ability to design, integrate, and evaluate adaptive algorithms and machine learning models for automation process optimization

Judgement and approach

- demonstrate the ability to select appropriate machine learning approaches for specific automation challenges
- demonstrate an understanding of data quality and system reliability considerations in intelligent automation
- demonstrate the ability to assess the performance and efficiency impact of intelligent automation implementations

Content

This course introduces machine learning and artificial intelligence techniques specifically designed for automation systems. Building on foundations in automation theory and applied programming, students will develop intelligent solutions using mainly open-source tools, frameworks, and libraries. The course emphasizes practical implementation of intelligent data processing and decision-making systems that can be integrated with traditional automation hardware and software.

The course includes the following elements:

- Machine learning fundamentals for automation applications
- Intelligent sensor data processing and pattern recognition
- Machine learning algorithms for monitoring and fault detection
- Real-time prediction and decision-making systems
- Data preprocessing and model deployment in production environments
- Performance evaluation and system optimization

Type of instruction

The course combines programming laboratories, project work, case studies, and seminars. Students work with industrial or publicly available datasets and develop practical solutions using open-source libraries and frameworks. Seminars include industry case presentations, technology reviews, and project demonstrations. Guest lectures from industry professionals can be used to showcase potential applications where intelligent automation can be used.

Language of instruction is English.

Entry requirements

Passed courses of at least 210 credits in the programme Industrial Product Realisation, or passed courses of at least 90 credits in Mechanical Engineering, Product Development, Materials Engineering, Manufacturing Engineering, Production Engineering, Industrial Engineering, Civil or Construction engineering, Industrial Organization and Economics, Automation and Robotics Engineering or the equivalent. The bachelor's degree should comprise a minimum of 15 credits in Mathematics. Taken courses in Automation and Production Technology, 7.5 credits, and Applied Industrial Automation, 7.5 credits, or the equivalent. Proof of English proficiency is required.

Examination and grades

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

The final grade for the course is based upon a balanced set of assessments. The final grade will only be issued after satisfactory completion of all assessments.

Registration of examination:

Name of the Test	Value	Grading
Examination	2.5 credits	5/4/3/U
Project	2.5 credits	5/4/3/U
Assignment	2.5 credits	5/4/3/U

Other information

Exemption from entry requirement allowed according to the selection groups of the program, where the course is included.

Course literature

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