JÖNKÖPING UNIVERSITY
School of Engineering

COURSE SYLLABUS

Applied AI in Product and Production Development, 7.5 credits

Tillämpad AI i produkt och produktionsutveckling, 7.5 högskolepoäng

Course Code:	TTAR26	Education Cycle:	Second-cycle level
Confirmed:	Feb 01, 2025	Disciplinary domain:	Technology
Valid From:	Aug 31, 2026	Subject group:	Mechanical Engineering
		Specialised in:	A1N Second cycle, has only first-cycle course/s as entry requirements
		Main field of study:	Production Systems, Product Development

Intended Learning Outcomes (ILO)

On completion of the course the student shall:

Knowledge and understanding

- show familiarity with AI tools, methods, and learning algorithms relevant to product and production development
- display broad knowledge of AI applications in various aspects of industrial production,
- show familiarity with AI and its potential impact on product and production development

Skills and abilities

- display the ability to select and apply appropriate AI tools and techniques for various industrial challenges
- demonstrate the ability to in data preprocessing, feature engineering, and model evaluation in the context of production data
- demonstrate skills of designing and conducting AI experiments to improve production processes
- demonstrate the ability to critically analyse and interpret results from AI models in industry

Judgment and approach

- demonstrate the ability to analyse products and production systems, proposing and validating AI solutions against company objectives
- demonstrate the ability to make informed decisions on AI implementation, considering technical, economic, and ethical factors

Content

This course provides a comprehensive introduction to applied AI in product and production development. Students will learn about various AI technologies, with a focus on computer vision, machine learning, and neural networks. The course emphasizes practical and context-specific applications relevant to production facilities, including quality control and assembly processes. Students will gain hands-on experience with AI platforms, coding, and utilizing libraries and frameworks required to develop such projects. The course aims to bridge the gap between theoretical AI knowledge and its practical implementation in industrial settings.

The course includes the following elements:

- Introduction to AI in product and production development
- Computer programming for AI applications
- Computer vision techniques for industrial applications
- Machine learning algorithms for products and production development
- Neural networks and deep learning in manufacturing

- AI libraries and frameworks (e.g., TensorFlow, PyTorch, scikit-learn)
- AI in for example quality control, process optimization, and predictive maintenance

Type of instruction

The course is given in lectures, exercises, lab work, and through a project.

Language of instruction is in English.

Entry requirements

Passed courses of at least 210 credits in the program Industrial Product Realisation, or a bachelor's degree (i.e the equivalent of 180 ECTS credits at an accredited university) with at least 90 credits in Mechanical Engineering, Product Development, Materials Engineering, Manufacturing Engineering, Industrial Engineering, Civil or Construction Engineering, or the equivalent. The bachelor's degree should comprise a minimum of 15 credits in Mathematics. Taken course in computer programming on bachelor level, or the equivalent. Proof of English proficiency is required.

Examination and grades

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

All test needs to be passed before the final grade is given.

Registration of examination:

Name of the Test	Value	Grading
Examination	4 credits	5/4/3/U
Project	2 credits	G/U
Assignment	1.5 credits	G/U

Course literature

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