



## COURSE SYLLABUS

# Digitalization and Automation in Engineering Processes,

### 7.5 credits

*Digitalisering och automation i produktframtagning, 7,5 högskolepoäng*

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<b>Course Code:</b> TDAR22	<b>Education Cycle:</b> Second-cycle level
<b>Confirmed by:</b> Dean Mar 1, 2021	<b>Disciplinary domain:</b> Technology
<b>Revised by:</b> Oct 25, 2023	<b>Subject group:</b> MT1
<b>Valid From:</b> Jan 1, 2025	<b>Specialised in:</b> A1N
<b>Version:</b> 2	<b>Main field of study:</b> Product Development

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### Intended Learning Outcomes (ILO)

After a successful course, the student shall:

Knowledge and understanding

- demonstrate comprehension of Product Lifecycle Management (PLM) tools and their integration
- display knowledge of tools and methods for structuring design tasks and design knowledge
- demonstrate comprehension of Product Data Management (PDM)

Skills and abilities

- demonstrate skills in prescribing and using PLM and PDM tools
- demonstrate the ability to structure design tasks and design knowledge
- demonstrate skills in facilitating engineering processes in the industrial context
- demonstrate skills in identifying different types of design processes

Judgement and approach

- demonstrate the ability to analyse design processes for the planning of computer support and automation

### Contents

This course provides knowledge on how to facilitate and improve the quality of design and engineering work using computer support, PLM and PDM tools. The students will learn how to understand different types of design and engineering processes.

The course includes the following elements:

- Classification of design tasks and design knowledge
- Mapping of design processes and design knowledge
- Representation of knowledge and reasoning such as Dependency Structure Matrix, Constraint-programming, Knowledge based engineering, Case Based Reasoning, Configuration and Parametric design

- PLM and PDM
- Design Automation
- Actual industrial cases in design automation

### Type of instruction

The teaching is conducted in English.

### Prerequisites

The applicant must hold the minimum of a bachelor's degree (i.e the equivalent of 180 ECTS credits at an accredited university) with at least 90 credits in Mechanical Engineering, Civil Engineering (with relevant courses in construction), or equivalent. The bachelor's degree should comprise a minimum of 15 credits in mathematics and 7.5 credits in CAD, or equivalent. Proof of English proficiency is required.

### Examination and grades

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

Registration of examination:

Name of the Test	Value	Grading
Written examination <sup>†</sup>	4 credits	5/4/3/U
Tutorial	2 credits	U/G
Seminars	1.5 credits	U/G

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

### Course literature

The literature list for the course will be provided 8 weeks before the course starts.

Reference literature:

Hopgood, A.A, Intelligent Systems for Engineers and Scientists  
CRC Press LLC, 2001

L.Hvam, N.H.Mortensen, J.Riis, Product Customization, Springer eBooks, 2008