



## COURSE SYLLABUS

# Applied Engineering Design, 7.5 credits

*Tillämpad konstruktionsteknik, 7,5 högskolepoäng*

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<b>Course Code:</b> TTKR22	<b>Education Cycle:</b> Second-cycle level
<b>Confirmed by:</b> Dean Mar 1, 2022	<b>Disciplinary domain:</b> Technology
<b>Revised by:</b> Director of Education Oct 25, 2023	<b>Subject group:</b> MT1
<b>Valid From:</b> Aug 1, 2024	<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 successful course, the student shall;

Knowledge and understanding

- display knowledge of requirements management in product development
- display knowledge of the dependencies and conflicting objectives between requirements in different aspects of product development
- display knowledge of suitable physical prototyping methods for different manufacturing methods and purposes

Skills and abilities

- demonstrate the ability to apply methods to evaluate the fulfillment of different requirements for a product concept
- demonstrate skills of using computer aided engineering tools for evaluation of requirements
- demonstrate skills in developing and evaluating virtual and physical prototypes with respect to different aspects, such as, manufacturability, assembly, functionality, and structural strength
- demonstrate skills of implementing new solutions in product concept based on analysis from evaluation results
- demonstrate the ability to clearly communicate design rationale supported by evaluation and analysis

Judgement and approach

- demonstrate an understanding of how to manage conflicting objectives from various stakeholders in engineering design

### Contents

This course provides an opportunity to conduct project-based, hands-on, product development in collaboration with an industrial partner company, from an initial conceptual idea to a functioning prototype. A big part of the course is exposure to complex issues that arise from conflicting objectives, e.g., product performance vs cost.

The course includes the following elements:

- Re-design of an existing product, or a new design of a new product family member
- Building physical prototypes, hands-on, workshop
- Evaluating requirements using both virtual and physical testing
- Evaluating conflicting objectives (trade-off curves)
- Handling requirements for e.g., industrial design, production, sustainability, cost, tolerances, assembly, test standards, regulatory standards

### **Type of instruction**

The education is done through project work in groups. The project case is given by an industrial partner company. Lectures are conducted at campus together with guest lectures. Some guest lecturing is conducted as mandatory study visits at the partner company.

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.

The course examination is continuous, through project deliverables, project gate presentations and mandatory study visits.

Registration of examination:

Name of the Test	Value	Grading
Project report	7.5 credits	5/4/3/U

### **Course literature**

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