

## Development of Product- and Manufacturing Technology 15 credits

Produkt- och produktionsframtagning 15 hp

Second cycle

Main field: Mechanical Engineering, Second cycle, has only first-cycle course/s as entry requirements (AIN)

Syllabus is adopted by the Research and Education Board (2024-03-05) and is valid for students admitted for the autumn semester 2024.

### Placement in the Academic System

The course is included in Master's Programme (60 credits) in Mechanical Engineering.

### Prerequisites and Conditions of Admission

Degree of Bachelor of Science with a major in Mechanical Engineering. The degree must be equivalent to a Swedish teknologie kandidatexamen and must have been awarded from an internationally recognised university. English 6. Exemption of the requirement in Swedish is granted.

### Course Objectives

The course aims to provide knowledge about important theories and methods in the field. The aim is also that the student develops knowledge about the choice and application of methodology for practical problem solving as well as for communication of obtained results. The course's goal is also to highlight state-of-the-art in technical product and production development.

Following successful completion of the course the student should:

#### *Knowledge and understanding*

- describe fundamental concepts, theories and scientific results in mechanical engineering product- and production development, as well as how mechanical engineering product- and production development methodologies are applied in industry
- describe the different steps in the production development chain from idea to recycling
- explain how different optimization criteria can be translated into a methodology for effective product- and production development production

#### *Skills and ability*

- search and utilize appropriate literature, as well as analyze and apply relevant methodologies and selected tools to solve mechanical product and production development problems

- apply knowledge in mathematical modeling in product development, as well as propose and apply well founded methodologies for prototype production and product testing
- communicate their results in speech and writing with an engineering language

#### *Judgement and approach*

- analyze advantages and disadvantages of various product- and production development methodologies in relation to product and branch of industry, as well as propose appropriate methodologies
- reflect on the role of the engineer in society as well as their impact on economic, social and environmental aspects
- critically review and judge their own and others' results against relevant theory and the current mechanical research front, as well as identify their need for further knowledge in the field

### Primary Contents

The course deals with basic concepts and theories as well as methods and tools for product- and production development, industrial examples of product- and production development, and the role of the production in the product development chain. More specifically, the course deals with problem formulation, concept development, design of parts, mathematical modeling, and cost- and environmental analysis. Furthermore, the course deals with project planning, group dynamics, literature search and source criticism as well as referencing.

### Teaching Formats

The teaching consists of lectures, supervised seminars, study visits and group work. The teaching is conducted in English.

### Examination

The overall grades of Fail, 3, 4 or 5 will be awarded for the course.

The examination consists of completed assignments and projects that must be presented orally and in writing. For guest

lectures and study visits, compulsory attendance is required (80%). Presence on final presentations of the project work is compulsory.

Name of the test		Grading
Assignment	1 credits	U/G
Project	14 credits	U/3/4/5

If there are special reasons, the examiner may make exceptions from the specified examination format and allow a student to be examined in another way. Special reasons can e.g. be a decision on learning support.

For elite sports students according to Riktlinjer för kombinationen studier och elitidrott vid Högskolan i Halmstad, DNR: L 2018/177, the examiner has the right to decide on an adapted examination component or let the student complete the examination in an alternative way.

### Course Evaluation

Course evaluation is part of the course. This evaluation should offer guidance in the future development and planning of the course. Course evaluations should be documented and made available to the students.

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## Course Literature and Other Study Resources

Karl T. Ulrich, Steven D. Eppinger. *Product design and development*. Latest edition

Kalpakijan S., Schmid S. *Manufacturing Engineering and Technology*, latest version.

Printed handouts and exercises.