



## Course syllabus

Faculty of Technology

Department of Mechanical Engineering

2MT340 Maskinkonstruktion B, 15 högskolepoäng

Machine Design B, 15 credits

### **Main field of study**

Mechanical Engineering

### **Subject Group**

Mechanical Engineering

### **Level of classification**

First Level

### **Progression**

G2F

### **Date of Ratification**

Approved by Faculty of Technology 2017-09-25

The course syllabus is valid from autumn semester 2018

### **Prerequisites**

At least 60 credits within the subject where 1FY804 Mechanics, 1MT003 Solid Mechanics, 1MT019 Engineering Materials, 2MT330 Machine design A, and 2MT020 Selection of Material Manufacturing Methods or similar.

## Objectives

After completing the course, the students is expected to:

- Apply scientific knowledge to dimension and design different types of mechanical transmissions and other machines
- Use standards and company catalogues in the work and process of machine design
- To dimension and design the various machines elements
- Apply the various machine elements in machine design process
- Apply machine design methodology in machine design process
- Demonstrate co-operation through among others communication of mechanical engineering work, and presentations of results.
- Define different mechanical failures which appears in machine elements and machine parts
- Analyse failure risks already in the machine design stage
- Identify the machine design role in product costs and its environmental impact.

## Content

### Part 1 - Theory

The theoretical part comprises of the following elements:

- Dimensioning and design of machine elements and machine parts based on scientific theories and ISO-standards
- Dimensioning and selection of machine elements and machine parts from company catalogues
- Mechanical failures in machine parts
- Analyses and management of failure risks in machine design
- Design for manufacturing
- Lubricants and their impact on the product life and the environment

### Part 2 - Project

The project(s) part of the course comprises of the following elements:

- Team building and project work
- Engineering thinking, dimension appreciation, and engineering creativity
- Machine design methodology by practicing (learning by doing)
- Holistic view of the entire machine design, and atomistic views of the details
- Training on using scientific theories, standards, and company catalogues in dimensioning and design of transmissions and related parts
- Application of risk management methods in machine design stage.

## Type of Instruction

Teaching consists of lectures, exercises and projects. Compulsory attendance to the project parts.

## Examination

The course is assessed with the grades A, B, C, D, E, Fx or F.

The grade A constitutes the highest grade on the scale and the remaining grades follow in descending order where the grade E is the lowest grade on the scale that will result in a pass. The grade F means that the student's performance is assessed as fail (i.e. received the grade F).

The course will be examined through written exam and project report, both parts will be graded A-F. The final grade is a weighted average of assessment methods.

## Course Evaluation

During the course or in close connection to the course, a course evaluation is to be carried out. The result and analysis of the course evaluation are to be communicated to the students who have taken the course and to the students who are to participate in the course the next time it is offered. The course evaluation is carried out anonymously. The compiled report will be filed at the Faculty.

## Credit Overlap

The course cannot be included in a degree along with the following courses of which the content fully, or partly, corresponds to the content of this course: This course replace the courses 2MT027 and 2MT014 and overlap with 12 credits.

## Other

Grade criteria for the A–F scale are communicated to the student through a special document. The student is to be informed about the grade criteria for the course by the start of the course at the latest.

## Required Reading and Additional Study Material

### Required reading

Juvinall, Robert. and Marshek, Kurt. Machine, Machine Component Design (fifth edition). John Wiley & Sons. Ca 300 pages, latest edition.



Khoshaba, Samir. Compendium about machine design. Will be available at Linnaeus University copy centre in Växjö

Khoshaba, Samir. Handbook for machine design. Will be available at Linnaeus University copy centre in Växjö

Standard sheets. Will be available at the course webpage on Mymoodle. Company catalogues will be available as PDF-versions on the course website on Mymoodle or/and as hard copies at the department of mechanical engineering.

**Reference literature**

Jelaska, Damir. Gears and gear drives (2012). John Wiley & Sons, Singapore. ISBN: 978-1-119-94130-9

Ugural, Ansel. C., Mechanical Design of Machine Components (2015). CRC Press Taylor & Francis Group, USA. ISBN 9781439887806

Von Beek, Anton, Advanced engineering design - Lifetime performance and reliability, (2009) TU Delft. ISBN: 10:90 810 406 18

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