



Course syllabus

Faculty of Technology

Department of Mechanical Engineering

2MT330 Maskinkonstruktion A, 7,5 högskolepoäng

Machine Design A, 7.5 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 2017-04-03

The course syllabus is valid from spring semester 2018

Prerequisites

15 credits Mathematics and 45 credits within the subject Mechanical Engineering where 1MT003 Solid mechanics is included, or similar.

Objectives

After completing the course the students are expected to have acquired:

- Basic knowledge about constructive dimensioning with respect to material selection, load, force flow, and stress concentrations,
- Dimensioning of structures/machine parts subjected to variable- or impact loads,
- Application of skills for dimensioning of different mechanical joints (fasteners, welded joints, etc.) and springs

Content

The course comprises the following elements:

- Introduction to machine design
- Selection of safety factors, and dimensioning with respect to and mechanical failures.
- Dimensioning of structures/machine parts with respect to different types of load cases, such as static, variable, or impact loaded, where stress concentrations and safety factors are taken into consideration.
- Design of structures/machine parts with respect to surface damages such as corrosion, wear, surface stress, etc.
- Dimensioning of screws, screw joints and welded joints
- Dimensioning of metal springs
- Engineering approach on structures/machine parts subjected to different types of loads,
- Design and dimensioning with respect to risks for human and environment as well as the economic risks.

Type of Instruction

The teaching consists of lectures, exercises and laboratory work/designproject. The designproject and the laboratorywork are compulsory.

Examination

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

The assessment of student performances takes place during special examination periods and may take the form of written exams, project report and laboratory work. The examination will be both written or oral. For the designproject/laboratories the grades Pass or Failed will be given.

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).

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: 2MT022/2MT322 7,5 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. och Marshek Kurt M. Machine Component Design (International Students Version), latest edition. John Wiley & Sons. 928 pages (300 pages).

Standardblad och företagskataloger

Khoshaba, Samir. Lecture Notes, LNU.

Khoshaba, Samir. Handbook for Machine Design, LNU

Reference Literature

Ugural, Ansel. C., *Mechanical Design of Machine Components* (Second Edition).
CRC Press. 995 pages

Collins, Jack. A., *Mechanical Design of Machine Element and Machines-A Failure
Prevention Perspective*. 912 pages