



MF2004 Advanced Machine Design 18.0 credits

Maskinkonstruktion, högre kurs

This is a translation of the Swedish, legally binding, course syllabus.

If the course is discontinued, students may request to be examined during the following two academic years

Establishment

Course syllabus for MF2004 valid from Autumn 2008

Grading scale

A, B, C, D, E, FX, F

Education cycle

Second cycle

Main field of study

Specific prerequisites

Compulsory for

MKN(M4, P4, T4)

Eligible are those who have finished these courses:

M-students MG1004, ME1001

P-students: MF1014, MH1005, SD1115, ME1001

T-students: EL1000, MF1017, SD2125, SE1025, SF1861, SF1907

Language of instruction

The language of instruction is specified in the course offering information in the course catalogue.

Intended learning outcomes

After completing this course you will be able to:

- Plan an lead product development work of modern integrated and modularized products.
- Design and detail both simple products as well as subsystems of more complicated mechanical products from idea to manufacturing drawings and prototype.
- Apply earlier acquired knowledge within e.g. mechanics, solid mechanics, electrical engineering and product development.
- Select material and manufacturing method in an engineering manner.
- Analyze and dimension both simple products as well as subsystems of more complicated mechanical products in an engineering manner.
- Develop and estimate loads for both simple products as well as subsystems of more complicated mechanical products, as a basis for dimensioning of structure elements as well as selection of machine elements and materials.
- Apply basic criteria for designing products considering e.g. load lines, load distribution, adaptation for manufacturing.
- Produce detail drawings including manufacturing tolerances for subsystems in complicated system products.

Design products in a way such that the environmental effect of the product is minimized.

Course contents

- Project work (mainly an industrial problem with focus on detail design in a system context)
- Innovation, creativity and patent
- Information sources and search, benchmarking
- The product development process, project planning
- Requirement specification, QFD
- Concept development, functions-means tree, concept selection
- Detail design, considering environmental effects, material selection, ergonomics.
- Solid mechanics for modeling and dimensioning (both using FEM and analytical)
- Manufacturing documents (detail drawings including manufacturing tolerances).
- Assembling, testing, evaluation, redesign
- Presentation and communication, both orally and in different form of written documentation.

Disposition

Period 2, 3, 4

Course literature

1 - Johannesson, Persson, Pettersson, "Produktutveckling – effektiva metoder för konstruktion och design", Liber Förlag, 2004.

2 – Olsson, Karl-Olof. "Maskinelement", Liber Förlag 2006.

3 – van Beek, Anton, "Advanced engineering design – Lifetime performance and reliability", TU Delft 2006.

Examination

- PRO1 - Project, 6.0 credits, grading scale: P, F
- PRO2 - Project, 6.0 credits, grading scale: P, F
- PRO3 - Project, 3.0 credits, grading scale: P, F
- TEN1 - Examination, 3.0 credits, grading scale: A, B, C, D, E, FX, F

Based on recommendation from KTH's coordinator for disabilities, the examiner will decide how to adapt an examination for students with documented disability.

The examiner may apply another examination format when re-examining individual students.

Ethical approach

- All members of a group are responsible for the group's work.
- In any assessment, every student shall honestly disclose any help received and sources used.
- In an oral assessment, every student shall be able to present and answer questions about the entire assignment and solution.