



MF2019 CAD 3D-modelling and Visualization 6.0 credits

CAD 3D-modellering och visualisering

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

Establishment

Course syllabus for MF2019 valid from Autumn 2015

Grading scale

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

Education cycle

Second cycle

Main field of study

Mechanical Engineering

Specific prerequisites

The course is a continuation from earlier courses:

• MF1044/MF1039 or the like, that brings up common machine elements

• and MF1045/MF1015/MF1040 or the like, where the participant has worked in a product realisation project, in a group on at least five students. The student has proven experience of different phases of the product development process.

Other students who want to take the course should have a Degree of Bachelor in Mechanical engineering or the equivalent, and should be able to:

1. Structure, formulate and write a technical report using a word processor, e.g. Word.
2. Present results by means of presentation programs, such as Powerpoint.
3. Introductory CAD modelling (i.e. creating part and assembly models, exploded views and drawings from a 3D model).
4. Dimension common machine elements.

Language of instruction

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

Intended learning outcomes

After passing the course, the students should be able to:

- Create a CAD model with product and manufacturing information (PMI) from a system perspective.
- Create a CAD model with mixed technical contents, e.g. mechanical and electric components.
- Be familiar with modelling modules (i.e. different applications and environments) in a CAD system for design of machine elements.
- Make force and motion analysis of a mechanism model.
- Carry out interference analyses.
- Create communicative representations of CAD models to present and describe design and behaviour of a product.

Course contents

The course treats mainly virtual prototype production with parameterized solid models, but the participants will also be introduced in basic surface modelling. Furthermore, the participants will obtain possibility to test, how it is to work synchronous (also called direct modelling), which possibilities and difficulties it gives.

Disposition

In the course, three written assignments been included, where the participants may train in to:

1. create part and assembly models
2. work in harness design, sheet metal modelling and rendering environments

3. make a force and motion analysis of a mechanism model and transfer the information to a Finite Element Analysis. All assignments should be presented using communicative images and/or films.

The other part of the course consists of an individual project assignment, where a detailed CAD model of a product of the student's own choice should be developed. The modelled product should contain both electronic components and mobile mechanisms. Each participant will also review another course participant's model.

Course literature

Innovation in Product Design: From CAD to Virtual Prototyping by Monica Bordegoni and Caterina Rizzi (e-book from KTH the Library)

Through the course web, the students get access to lecture material and material that is needed to do the written assignments and the project.

Examination

- ÖVN1 - Exercise, 3.0 credits, grading scale: P, F
- ÖVN2 - Project Work, 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.

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

To pass the course should the following be approved:

Three individual written assignments (3 credits) that should be delivered within specified time. The written assignments have grading scale P/F. If all assignments are not approved during one single course offering, all assignments must be redone in a new course offering.

The individual project part (3 credits) of the course has grading scale A-F, including the possibility to get an Fx grade. This grade reflects the course grade. [OBSERVE: If the grade Fx is given, what is missing must be handed in and be approved before the next course offering. If not, the whole project part must be redone in a later course offering.] If the project is not handed in during the current course offering, the project can only be handed in and be assessed twice each year (in May and in December) in connection with other course offerings. The course is developed continuously and the possibility to be assessed according to course plans of course offerings that were completed more than two years ago, may be lost, completely or partly.

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.