MF2076 Machine Design Advanced Course Part I 9.0 credits

Maskinkonstruktion högre kurs del I

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

Establishment

On 2021-10-15, the Dean of the ITM School has decided to establish this official course syllabus to apply from spring term 2022 (registration number M-2021-2030).

Grading scale

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

Education cycle

Second cycle

Main field of study

Mechanical Engineering

Specific prerequisites

Bachelor of Science, subject area mechanical engineering or equivalent

MF2010 Component design or the equivalent

MF2068 Machine Dynamics or the equivalent

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:

1. Plan and participate at development of both integrated and modularised mechanical products

2) Carry out the early phases of the product development process from specification and concept generation to prototyping based on a systematic approach. Design and detail both components and subsystems of mechanical products from concepts to manufacturing documentation and prototypes with a focus on:

· Retrieving a specification.

· Applying methods for concept generation and evaluation of concepts utilising matrix based methods.

· Analyse and verify product concepts against the set requirements in the specification.

· Create simple physical or digital models for evaluation of concept properties.

3. Apply principles of ecofriendly design and reflect on environmental consequences of for example choice of concept and design.

4. Include perspectives of gender equality, diversity and equal opportunities, JML, when developing mechanical products.

Course contents

Machine design is a generic term for design of different types of products, everything from complex composite machines, e.g. cars to simple products, e.g. bicycle transmissions, that we come across in our daily life.
To design implies that we should create new solutions for the problems we are facing, in an engineering correct way, i.e. we should solve the right problems, preferably as simply as possible, which also have real, industrial relevance, considering aspects such as finance, energy and environment. As an aid in the design work, we utilise modern computer programs for geometry definition and analysis, but estimates are also important.

The course is a professional or vocational course for you as future design engineer or product designer. The course introduces a JML perspectives on product development in teams, with a distancing from all forms of discrimination.
The course gives knowledge and training in projecting, participating in and leading development work of modern integrated and/or modularised products. Furthermore, you are trained in using computer aided design, simulation and analysis and to communicate technical results orally and in written.

The course is project-based and focuses on the early phases of the product development process. It implies that you will work in a group and focus on a defined project, and plan for

and also carry out concept generation and evaluation for the specific project task that your group has been assigned. The course is an applied course, which the implies that previously acquired knowledge from areas such as mechanics, solid mechanics, electrical engineering, product development and design is applied in the work with the current project.

The course includes the early phases of the design process, which implies that the following activities are commonly occurring in the project work.

· Project-based working methods, including project management and follow-up of project plans.

· Development of specification, concept generation and evaluation of concepts. Furthermore, simple physical or digital prototypes should be created for selected product concepts.

· Application of a systematic model-based development process at analysis, simulation and verification of product concepts during the concept phase

Application of principles of ecofriendly design and reflection over

Examination

- INL1 - Assignment, 3.0 credits, grading scale: P, F
- PROA - Project, 5.0 credits, grading scale: A, B, C, D, E, FX, F
- TENA - Digital Quiz, 1.0 credits, grading scale: P, 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.

Written assignments (individual) and project (group) are assessed and marked separately. The final grade is based on a weighted average of these examination parts.

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.