MF2031 Advanced Prototyping 6.0 credits

Avancerad prototypframtagning

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 MF2031 valid from Autumn 2013

Grading scale

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

Education cycle

Second cycle

Main field of study

Mechanical Engineering

Specific prerequisites

MF101X/MF102X/MF104X/MF111X/MF112X/MF114/MF116/MF106X/MF107X/MF109X or Bachelor

TIPUM, TIPUD, TAEEM

Language of instruction

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

Intended learning outcomes

After completion of this course you will be able to

- describe the role of product prototyping in the product development process
- describe the relation and the difference between virtual and physical prototypes
- describe different methods to manufacture physical prototypes and when to select one before another
- select a prototype method to manufacture a specific prototype and motivate this choice with respect to purpose, cost, time and quality
- create 3D CAD models suitable for advanced prototyping methods
- create a virtual and physical model based on reverse engineering technology
- explain the relation and difference of various digital 2D/3D formats
- make a cost calculation and budget for a prototype development

Course contents

This course aims to give the students knowledge about what types of modern methods that can be used for advanced product prototyping. The role of prototyping in the product development process is discussed and also in which phases different methods are to be preferred compared to others. A central theme in the course is that all methods are using a 3D geometry model as main information carrier and that each prototype being built has a specific purpose for what properties to reveal of the final product. The strength and weaknesses of the different methods are also discussed as well what product properties they are suitable to represent.

Disposition

This course aims to bring a theoretical overview of available methods for advanced prototyping as well as knowledge of practical handling of a selected number of those such as 3D printing, 3D scanning, milling and waterjet. This means that a large part of the course is assigned to labs, exercises and project work.

A couple of lectures will be held in the beginning of the course. The theoretical course content is presented at these lectures together with the literature and the practical content is included in labs and the project work. The 4 lab activities are milling, 3D printing, scanning and waterjet manufacturing.

Project work:

A number of students (3-4) will design a prototype and manufacture it using the methods trained at during the labs. A large part of the course is concentrated to project work. The final result of the project work will be orally presented and a written report is also required. More information about the project is given in the project description presented at the start

Labs

Four lab activities, milling, 3D printing, scanning and waterjet are mandatory. A number of different occasions for each lab will be given. The preparation tasks that are practiced at the exercises are mandatory to deliver before attending corresponding lab.

Course literature

Presenteras vid kursstart.

Examination

- LAB3 - Laborations, 1.0 credits, grading scale: P, F
- PRO3 - Project Work, 2.0 credits, grading scale: A, B, C, D, E, FX, F
- TEN2 - 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.

Other requirements for final grade

The final grade is given by the weighted value of the project work and the written exam.

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.