LUNDS UNIVERSITET
Lunds Tekniska Högskola

Course syllabus

Digital prototypframtagning
Rapid Prototyping

MMKF45, 7,5 credits, G2 (First Cycle)

Valid for: 2023/24
Faculty: Faculty of Engineering, LTH
Decided by: PLED M
Date of Decision: 2023-04-11

General Information

Compulsory for: MD4
Elective for: M4
Language of instruction: The course will be given in English

Aim

The course aims to provide knowledge of methods for manufacturing prototypes from computer-based models. It also aims to increase the understanding of the entire process, from creating computer-based models to their physical realization. The knowledge is obtained by practical work on a project.

Learning outcomes

Knowledge and understanding
For a passing grade the student must

- be familiar with the principles of the different rapid prototyping methods
- be familiar with the methods' areas of usage, possibilities and limitations, as well as environmental effects
- be familiar with the characteristics of the different materials that are used in rapid prototyping
- Have knowledge about approaches for evaluation of a prototype's robustness
- Be familiar with the principles of cognitive interaction, hence how users understand their interaction with a prototype

Competences and skills
For a passing grade the student must

- be able to create virtual models that can be realised through a direct manufacturing method
- be able to select an appropriate method for manufacturing a prototype
- be able to employ rapid prototyping in design and engineering
- be able to identify errors/ fault-tracing prototypes
- be able to design a prototype which is effective in recycling and repair

Judgement and approach
For a passing grade the student must

- be able to use rapid prototyping to communicate a concept in design and engineering
- be able to evaluate the effectiveness of the user interface and the prototype's functionalities.

Contents

The course consists of lectures and workshops, including demonstrations and supervision. Carrying out a course project in teams of 3-5 students is the primary learning activity in this course. The teachers are available for group supervision only. The course plan specifies the number of hours for supervision per team. The theoretical part of the course aims to improve the students' understanding of rapid prototypes and their potential use. The practical part aims at developing an interactive product prototype. A portion of this interactivity is to program an Arduino to steer different sensors/servos. The student does not need any pre-conceptions about programming; it is all provided within the course. The course has the following mandatory components: The introduction lecture, all 'work-in-progress presentations and the final presentation.

Examination details

Grading scale: TH - (U,3,4,5) - (Fail, Three, Four, Five)
Assessment: The assessment is based on all work-in-progress presentations, the final presentation and project documentation. Each student shall demonstrate their contribution to the group work, both process and result. The grading of the group project will equal each student's individual grade.

The examiner, in consultation with Disability Support Services, may deviate from the regular form of examination in order to provide a permanently disabled student with a form of examination equivalent to that of a student without a disability.

Admission

Assumed prior knowledge: MMKA25 Manual and Computer Aided drafting in Mechanical Engineering.
The number of participants is limited to: No

Reading list

- Norman D (2013) The design of everyday things. Hachette, UK, ISBN:9780465072996 (earlier/later editions of the same book is also OK).
- More literature might be added during the course based on each project's need.

Contact and other information

Course coordinator: Per Kristav, per.kristav@design.lth.se
Director of studies: Elin Olander, elin.olander@design.lth.se
Course homepage: http://www.product.lth.se/education/
Further information: With less than 5 participants, the course may be given with reduced teaching and more self studies.