Engineering Design Methodology

Programme course

6 credits

Konstruktionsmetodik

TMKA05

Valid from: 2017 Spring semester

Determined by
Board of Studies for Mechanical Engineering and Design

Date determined
2017-01-25

Main field of study
Product Development

Course level
First cycle

Advancement level
G1X

Course offered for
- Design and Product Development, M Sc in Engineering

Entry requirements
Note: Admission requirements for non-programme students usually also include admission requirements for the programme and threshold requirements for progression within the programme, or corresponding.

Prerequisites
Mechanics, Design and Product Development

Intended learning outcomes
The course aims to introduce design methodology and how it can be used throughout the product development process. After completing the course, student should be able to
• tackle technical issues in a systematic manner using general design methodology, from requirements through concept selection, preliminary and detailed layout, to finished physical prototype.
• describe and explain the design process.
• explain the concepts of function, technical principle and technical function/mean.
• apply the methods above to create new creative technical solutions to customer specific problems.
• using the CAD tool throughout the design process in an efficient manner.
• provide accurate manufacturing data from CAD models.
• apply the theoretical course objectives on a given design task and present the results both orally and written.

Course content

Product development. The design process and the role of the designer. Types of design problems. Problem analysis and specification. Concept generation including function analysis and concept generation. Concept evaluation and selection. Layout design. Computer aided design and analysis. Writing report and oral presentation.

Teaching and working methods

The course lasts throughout the fall semester and is organized in a series of lectures, classes, computer labs and a mandatory project assignments. The lectures introduce and explains the design methodology from a theoretical perspective and lessons provide in-depth knowledge of design methodology. The first theoretical part is assessed with a written test. Computer classes provides techniques for efficient modeling and analysing using the CAD tool. The project is carried out in small groups and is focused on concept generation where a relatively open problem is to be tackled with creative technical solution. The task will result in CAD models of the chosen solution along with a physics demonstrator. Presentation of the project work is done orally as well as written.

Examination

KTR1	Written test	3 credits	U, G
PRA1	Project assignment	3 credits	U, G

Grades

Two-grade scale, U, G

Department

Institutionen för ekonomisk och industriell utveckling

Director of Studies or equivalent

Peter Hallberg

Examiner

Vanja Palasevic

Course website and other links

Education components

Preliminary scheduled hours: 55 h
Recommended self-study hours: 105 h

Common rules

Regulations (apply to LiU in its entirety)

The university is a government agency whose operations are regulated by legislation and ordinances, which include the Higher Education Act and the Higher Education Ordinance. In addition to legislation and ordinances, operations are subject to several policy documents. The Linköping University rule book collects currently valid decisions of a regulatory nature taken by the university board, the vice-chancellor and faculty/department boards.

LiU's rule book for education at first-cycle and second-cycle levels is available at http://styrdokument.liu.se/Regelsamling/Innehall/Utbildning_pa_grund-_och_avancerad_niva.