Engineering Design and Product Development

Programme course

6 credits

Konstruktionsmetodik

TMPS18

Valid from: 2017 Spring semester

Determined by
Board of Studies for Industrial
Engineering and Logistics

Date determined
2017-01-25

Offered for the last time
Autumn semester 2017

Main field of study

Mechanical Engineering

Course level

Second cycle

Advancement level

A1X

Course offered for

- Industrial Engineering and Management - International, M Sc in Engineering
- Industrial Engineering and Management, 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.

Intended learning outcomes

The course is aimed at tools and methods for systems engineering and design. The course should give an ability to use different methods for engineering design later in projects with industrial applications. After the coruse the student should be able to:

- Understand the dynamics of innovation
- Formulate requrement specifications
- Apply methods for functional decomposition, requirements management, and concept generation
- Apply morphological matrix for concept selection
- Generate models based on statistical data regarding relations between different system/component charateristics
- Produce sensitivity analysis of a system and be able to draw conclusions regarding robusteness and the degree of coupling.
- Apply "falure mode analysis" FMEA, and "fault tree analysism, FTA.

Course content

The lectures deals with systematic design tools, including requirement specification, problem formulation, functional analysis, koncept generation, configuration methodolog, morphological matrices, axiomatic design, design structure matrix (DSM), QFD, sensitivity analysis, robustness, statistical methods of existing products to find initial relations for dimmensioning, estimation of power, force, torque and weight, and volume. In addition, methods for system safety such as "faliure mode effect analysis", FMEA, and "fault tree analysis" FTA are dealt with.

Teaching and working methods

Lectures and computer exercises

Examination

UPG1	Assignments	2 credits	U, G
TEN1	Written examination	4 credits	U, 3, 4, 5

Grades

Four-grade scale, LiU, U, 3, 4, 5

Department

Institutionen för ekonomisk och industriell utveckling

Director of Studies or equivalent

Petter Hallberg

Examiner

Petter Krus

Education components

Preliminary scheduled hours: 48 h
Recommended self-study hours: 112 h

Course literature

Additional literature

Compendia

P Krus, Design Analysis and Synthesis

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.