



COURSE SYLLABUS

Computer Supported Engineering Design, 9 credits

Datorstöd för konstruktion, 9 högskolepoäng

Course Code: TDKS27	Education Cycle: Second-cycle level
Confirmed by: Dean Feb 1, 2017	Disciplinary domain: Technology (95%) and social sciences (5%)
Valid From: Aug 1, 2017	Subject group: MT1
Version: 1	Specialised in: A1F
Reg number: JTH 2017/1933-313	Main field of study: Product Development

Intended Learning Outcomes (ILO)

On completion of the course, the student should

Knowledge and understanding

- Demonstrate comprehension of manual and automated design processes
- Be familiar with techniques for automation of design processes
- Being familiar with the mapping of design processes and design knowledge
- Being familiar with useful tools to structure design tasks and design knowledge

- Know useful tools to structure design tasks and design knowledge

Skills and abilities

- Demonstrating ability to develop automated systems for configuration and parametric design
- Demonstrating ability to classify design tasks and design knowledge
- Demonstrating ability to structure design tasks and design knowledge
- Demonstrating ability to acquire knowledge about design processes

Judgement and approach

- Demonstrating ability to analyze a real design process to plan computer support and automation

Contents

Engineers manage big amounts of digital information about the products they develop. Such information is stored in a variety of formats (e.g. Excel, MathCAD, Access, CATIA, and Solidworks). It is possible to automate some of the efforts engineers put on managing and processing that information, which has proven to shorten development lead-time and enhancing productivity. This course gives you basic knowledge and abilities to automate engineering design task through computer programming.

The course includes the following topics:

- Need for different types of computer support – analysis/synthesis.

- Classification of design tasks and design knowledge
- Mapping of design processes and design knowledge
- Representation of knowledge and reasoning (Dependency Structure Matrix, Ontologies, Constraint-programming, Knowledge based engineering, Case Based Reasoning (Matching of design problems and solution strategy (Configuration, Parametric design, Generative systems)
- Practical experience from industrial systems for automated
- A systematic procedure to develop systems for automated design
- Optimization

Type of instruction

Lectures, exercises, and assignments/project work

The teaching is conducted in English.

Prerequisites

Passed courses 180 credits in first cycle, at least 90 credits within the major subject Mechanical Engineering, and 21 credits Mathematics, and completed course Computer Programming for Design Automation, 6 credits, and English Language requirements corresponding to English 6 or English B in the Swedish upper secondary school (or the equivalent).

Examination and grades

The course is graded 5,4,3 or Fail.

Registration of examination:

Name of the Test	Value	Grading
Examination ¹	5 credits	5/4/3/U
Assignments/Project work	4 credits	U/G

¹ Determines the final grade of the course, which is issued only when all course units have been passed.

Other information

Exemption from entry requirement allowed according to the selection groups of the program, where the course is included.

Course literature

Literature

The literature is preliminary until one month before the course starts.

Title: Intelligent Systems for Engineers and Scientists

Author: A.A.HopGood, 2001

Publisher: CRC Press LLC

ISBN:

Title:Product Customization

Author: L.Hvam, N.H.Mortensen, J.Riis, 2008

Publisher: Springer eBooks

ISBN: