



# MG2028 CAD and Other IT Tools in Industrial Processes 6.0 cred- its

**Inte bara CAD - IT-verktyg i industriell produktframtagning**

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 MG2028 valid from Autumn 2007

## **Grading scale**

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

## **Education cycle**

Second cycle

## **Main field of study**

## **Language of instruction**

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

## **Intended learning outcomes**

After completing the course requirements each student should be able to:

- create robust CAD models, which could easily be understood and further developed by others
- as a member of a project group create and exchange information about a product and its manufacturing by:
- creating models of complex products and their features, using a modern CAD system
- performing a simple analysis of the strength features of a part model, by using a FEM program
- creating a simple production plan for a CAD part model, using a CAM system
- creating a simple plant layout using a plant layout system
- using common exchange formats for product data exchange between different information handling software systems
- using a pre-configured PDM system for storing and retrieving documents and other product and production data following a well-structured and well-defined process
- understand and expressed in his/her own words a description of how product and production information is handled in a manufacturing company, and how they use IT tools in their product realization process
- give an account of the most common problems regarding information handling in a product realization process
- express in his/her own words the principal modules and the most important user functions in a PDM system
- name and describe in brief the use of a few other types of product and production information handling IT tools and how they can be utilised in a industrial product realization process:
- materials and resource planning (MRP) systems
- systems for event driven simulation of manufacturing plants
- offline programming systems for robots and machine cells
- product configuration systems
- visualization systems, such as VR systems- ERP systems

## Course contents

Following an introductory part where CAD skills are further developed, the course is divided into five different subtasks, each focusing on one type of IT tool used by mechanical engineers in manufacturing industry. Each of these tasks are dealt with during approximately one week, including at least one introductory lecture, one lecture dealing with industrial aspects and one supervised computer laboratory exercise. In addition to this basic computer exercise, the students can opt to take one further, more advanced, non-supervised exercise. Much of the work during the course is hands-on, working in our department's computer lab.

**Task 1:** Methodology and information handling in the product realization process including a computer exercise in PDM.

**Task 2:** FEM and other CAE systems. Computer exercise, using a FEM system.

**Task 3:** Production planning, CAM and other systems for offline programming of machine tools and robots. Computer exercise in CAM.

**Task 4:** Plant layout, developing simple layouts of machining cells and production lines in a manufacturing plant. Computer exercise, using a plant layout and simulation system

**Task 5:** Standards for representing, sharing and exchanging product data. Computer exercise in product data exchange. In addition, each student is required to write a short technical report on the use of IT tools in a typical product realization project, preferably one in which he/she has taken active part. This report should include both a technical description, and a critical evaluation with suggested improvements of the computer supported environment used in the project

## Specific prerequisites

MF1012 Design and Product Realization A or  
MG1003 Product Realization 1 or  
MF1015 Product Realization

or equivalent

Swedish B and English B or equivalent

## Course literature

Course binder, which will be filled with lecture notes, articles, exercises etc., throughout the course.

## Examination

- LAB1 - Laboratory Work, 1.5 credits, grading scale: P, F
- ÖVN1 - Project 1, 3.0 credits, grading scale: A, B, C, D, E, FX, F
- ÖVN2 - Project 2, 1.5 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

Completed exercises in robust CAD modeling. Completed computer exercises for all tasks. Completed individual technical report.

## 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.