Course syllabus

CAD/CAM/CAE
Computer Aided Design/Computer Aided Manufacturing

MMTF25, 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

Main field: Technology.
Compulsory for: MD1
Elective Compulsory for: M3
Elective for: BME4, I4-pr, MPRR1
Language of instruction: The course will be given in English on demand

Aim

Today, both small and large industrial companies are facing strong global competition leading to the need to continually improve and streamline both its manufacturing and product development processes. Large companies are often global and require IT systems to effectively store, manage and visualize products and documents in global business environments. Smaller companies are often dependent on effective partnerships with suppliers in particular as regards the exchange of product data. The need to reduce product development lead times in order to more quickly bring products to market and to be flexible for customized solutions require an integrated IT support. The purpose of this course is to give students a broad overview of the components of this integrated IT support, and provide students with skills in different areas of application available in a modern 3D modeling software tool for product development.

Learning outcomes

Knowledge and understanding
For a passing grade the student must

- be able to identify the components that together build up a computer based engieering support.
- be able to understand the potential of a three dimensional solid model and to utilize this in different applications and for different purposes in an enterprise.
- be able to identify and discuss concepts and functions within the field of subject at such a manner that the student can formulate the criterias for development or investment in computer based engineering support.
- be able to orally describe and discuss an arbitrary sub-area within the field of subject.

Competences and skills
For a passing grade the student must

- be able to create advanced solid models with the software Creo Parametric.
- be able to use the 3D-modelling, assembly, manufacturing,operations planning and vizualization features of Creo Parametric to create and visualize complex products.
- be able to execute a production planning where the solid geometry information is used to create NC tool paths and the machine set-up data is determined.

Contents

The theoretical part of the course deals with the different components and functions within the sub-areas computer aided design CAD, computer aided manufacturing CAM and computer aided engineering CAE. The content embodies basic CAD and CAM techniques, generating and manipulating assemblies,advanced solid modelling tools, transformations, projections, rendering, visualization, rapid prototyping, product data management (PDM) and product lifecycle management (PLM).

During the practical part of the course the student work independently with hand-in exercises that are solved with the commercial software Creo Parametric. The practical work involves working with various modules in Creo Parametric and include surface and solid modelling, assembling parts into a product, making drawings, simulation of movement and performing an animation, sheet metal forming and process planning for manufacturing.

Examination details

Grading scale: TH - (U,3,4,5) - (Fail, Three, Four, Five)
Assessment: Continuous assessment during the line of the course consisting of hand-in exercises, guest lectures and student teaching. At the end of the course there is a compulsory computer modelling test. If a student doesn´t pass the computer modelling test a new opportunity is given after the first occasion.

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: MMK010/MMKA25 Manual and Computer Aided Drafting in Mechanical Engineering and Calculus in one Variable.
The number of participants is limited to: 120
Selection: Completed university credits within the program. Within programmes where the course is given as a mandatory or elective mandatory course students are guaranteed admission. There after priority is given to students enrolled in programmes that include the course in the curriculum.

Reading list

- A course library with reference literature for the preparations of the student teaching sessions.

Contact and other information

Course coordinator: Hans Walter, hans.walter@iprod.lth.se
Teacher: Jinming Zhou, jinming.zhou@iprod.lth.se
Course homepage: http://www.iprod.lth.se
Further information: The student needs a computer identity to be able to work with the computer software used for the compulsory assignments.