Engineering Graphics 3D - course description

General information

Course name	Engineering Graphics 3D
Course ID	06.9-WM-MaPE-P-EngGraph3D-23
Faculty	Faculty of Mechanical Engineering
Field of study	Management and Production Engineering
Education profile	academic
Level of studies	First-cycle studies leading to Engineer's degree
Beginning semester	winter term 2023/2024

Course information

Semester	3
ECTS credits to win	2
Course type	obligatory
Teaching language	english
Author of syllabus	• dr inż. Julian Jakubowski, prof. UZ

Classes forms

The class form	Hours per semester (full-time)	Hours per week (full-time)	Hours per semester (part-time)	Hours per week (part-time)	Form of assignment
Laboratory	30	2	-	-	Credit with grade

Aim of the course

The aim of the course is to familiarize the student with the techniques of modeling 3D objects in a selected CAD system (AutoCAD, INVENTOR, SolidWorsk or CATIA), indicate the possibilities resulting from the use of specific CAD systems and acquire practical modeling skills in the selected system.

Prerequisites

Technical drawing, 2D engineering graphics

Scope

L1- Introduction to CAD systems, overview and characterization of selected CAD systems;

L2 - discussion of the possibility of obtaining student versions of selected programs; discussion of the working environment in the selected system; design creation, viewer, tool palettes, 2D sketches, and constraints

L3 - basics of 3D part modeling

L4 - structural elements, 3D part editing

L5 - advanced 3D part modeling features

L6 - Modeling of assemblies, constraints in assemblies, insertion of executed elements,

L7 - use of libraries of standard elements

L8 - Motion analysis, moving constraints, constraint animation,

L9 - Assembly presentation, exploding drawings, video recording

L10 - 2D documentation of parts, plans, cross-sections,

L11 - Describing 2D drawings, dimensions, descriptions, title blocks,

L12 - 2D assembly documentation, part numbering, summary tables

L13 - Modeling of sheet metal elements

L14 - Use of web libraries in design

L15 - Materials; rendering, neutral and standard formats for recording and exchanging data.

Teaching methods

Classes carried out in a computer laboratory. During the classes, the lecturer discusses individual issues using a video projector, while the student performs exercises independently. Within a given subject, individual student work is also envisaged at home (using the student version of the selected CAD system) or computer laboratory (outside didactic hours), in order to consolidate the material.

Learning outcomes and methods of theirs verification

Outcome description	Outcome symbols	Methods of verification	The class form
He has knowledge of computer-aided engineering systems in the field of mechanical engineering and work in the field of Production Management	• K_W33	• an observation and evaluation of the student's practical skills • an ongoing monitoring during classes	• Laboratory
The student has basic knowledge of the use of CAD systems in engineering design	• K_W09	• an observation and evaluation of the student's practical skills	• Laboratory
The student is able to use the CAD systems learned to communicate in the professional and other environments	• K_U08	• an observation and evaluation of the student's practical skills	• Laboratory
The student is able to use the CAD systems learned to communicate in the professional and other environments	• K_U11	• a check work • an observation and evaluation of the student's practical skills	• Laboratory
The student is able – according to the given specification – to draw a simple component (technical system subassembly) using computer-aided design methods	• K_U27	• a check work • an observation and evaluation of the student's practical skills	• Laboratory

Assignment conditions

The condition for passing is the correct solution of tasks consisting in drawing given objects, during the implementation of which the student must demonstrate knowledge enabling the operation and use of a specific CAD system. During the final presentation of all the tasks solved by him, the student demonstrates the ability to use information and communication techniques and communicate using them.

Recommended reading

1. Rajashekar Patil Computer Aided Engineering Graphics: Technical University New Age International Pvt Ltd Publishers, 2018.
2. Alan J. Kalameja AutoCAD 2020 Tutor for Engineering Graphics. Autodesk Press 2020.
3. Mark R. Stevens, J. Ross Beveridge Integrating Graphics and Vision for Object Recognition The Springer International Series in Engineering and Computer Science 589, 2001.

Further reading

1. Aleksandr Yurievich Brailov Engineering Graphics: Theoretical Foundations of Engineering Geometry for Design, Springer International Publishing, 2016.

Notes

Modified by dr inż. Julian Jakubowski, prof. UZ (last modification: 27-04-2023 10:36)