

Computer Aided Production Engineering - course description

General information	
Course name	Computer Aided Production Engineering
Course ID	06.9-WM-MaPE-QE-P-CAPE- 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	7
ECTS credits to win	5
Available in specialities	Quality Engineering
Course type	obligatory
Teaching language	english
Author of syllabus	<ul style="list-style-type: none">doc. dr inż. Julian Jakubowski

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
Lecture	15	1	-	-	Credit with grade
Project	60	4	-	-	Credit with grade

Aim of the course

Mastering knowledge and skills in the field of: presenting the product as a 3D model with the possibility of choosing a solid, surface or hybrid design method, the student will analyze and select Cax tools for a specific task, in addition, he will be able to design technological processes using CAM systems.

Prerequisites

Basic knowledge in the field of: information technologies, production processes and techniques, concurrent engineering, basics of engineering design, materials science.

Scope

Lecture:

1. Information technology in the computer-integrated product development lifecycle.
2. Selected technical, organizational and functional aspects of the implementation of computer techniques in the enterprise.
3. Technika projektowania odwrotnego, rapid tooling i rapid prototyping. Druk 3D
4. Selected elements of the Catia system: sketchbook, types of constraints,
5. Solid modeling methods
6. Surface Modeling
7. Assembly of assemblies
8. Virtualization of manufacturing. The role of 3D models in product and process development. Current trends in product development in manufacturing enterprises.

Project:

P1-P12: Selected modules of the Catia system. Familiarizing the student with the sketchbook module. Familiarizing the student with solid and surface modeling modules

P13:P20: Design of selected machine components

P21-P29 Actuator design. Virtual modeling of selected machine elements in the Catia system using learned 3D design modules. Project using virtual product assembly techniques, simulation of product operation and elements of virtual production. Presentation of stages and analyses in the shape system, material, manufacturing method for a given design issue.

P-30: Presentation and evaluation of solutions used during the implementation of processes. Analysis of selected and used tools during the implementation of a given project task.

Teaching methods

Conventional lecture with multimedia aids,

Project, group work using CAx systems

Learning outcomes and methods of theirs verification

Outcome description	Outcome symbols	Methods of verification	The class form
Is able to prepare, document and develop issues for a given technical problem using other fields of science, i.e. production engineering, materials engineering, construction and operation of machines, mechanics, automation and robotics, management.	<ul style="list-style-type: none">• K_U05	<ul style="list-style-type: none">• a preparation of a project	<ul style="list-style-type: none">• Lecture• Project
Can select and apply appropriate computer applications for calculations, simulations, design and verification.	<ul style="list-style-type: none">• K_U11	<ul style="list-style-type: none">• a project• an observation and evaluation of the student's practical skills• an ongoing monitoring during classes	<ul style="list-style-type: none">• Lecture• Project
He has structured, theoretically based knowledge in the field of calculations of physical parameters of models in CAX systems.	<ul style="list-style-type: none">• K_W03	<ul style="list-style-type: none">• an evaluation test• an ongoing monitoring during classes	<ul style="list-style-type: none">• Lecture• Project
Knows basic IT techniques and tools, including networking in solving engineering tasks related to Management and Production Engineering.	<ul style="list-style-type: none">• K_W07	<ul style="list-style-type: none">• activity during the classes• an evaluation test	<ul style="list-style-type: none">• Lecture• Project
Is able to interact and work in a group, taking on different roles in it.	<ul style="list-style-type: none">• K_K03	<ul style="list-style-type: none">• an observation and evaluation of activities during the classes	<ul style="list-style-type: none">• Lecture• Project
Can properly define priorities for the implementation of the task defined by himself and others	<ul style="list-style-type: none">• K_K04	<ul style="list-style-type: none">• a preparation of a project• an observation and evaluation of the student's practical skills	<ul style="list-style-type: none">• Lecture• Project
Can work individually and in a team, and skillfully manage the work of a team	<ul style="list-style-type: none">• K_U03	<ul style="list-style-type: none">• an observation and evaluation of the student's practical skills	<ul style="list-style-type: none">• Lecture• Project

Assignment conditions

Lecture: grade colloquium

Assessment issued on the basis of a written colloquium including verification of knowledge of basic issues.

Project: credit for assessment

Assessment determined on the basis of the component assessing skills related to the implementation of project tasks, its defense and preparation of project documentation and component for the "defense" by the student of the report on the implementation of the project.

Credit from the subject: weighted average:

Lecture 0.5 and Project 0.5

Recommended reading

1. Michaud Michel Catia core Tools: Computer Aided Three-Dimensional Interactive Application. The McGraw-Hill Companies Inc. 2012.
2. Jonathan Weaver, Nader Zamani CATIA V5 Tutorials Mechanism Design & Animation Release 21. Publisher: SDC Publications, 2012.
- 3.
4. Jaecheol Koh CATIA V5 FEA Release 21: A Step by Step Guide Publisher: Createspace Independent Publishing Platform, 2012

Further reading

CATIA Fundamentals Student Guide.

CATIA V5-6 R2015 Basics Part II: Part Modeling by Tutorial Books

Notes

Modified by dr inż. Julian Jakubowski, prof. UZ (last modification: 27-04-2023 19:28)

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