COURSE DESCRIPTION CARD - SYLLABUS

Course name
Integrated manufacturing systems of CAD/CAM/CAE [N2MiBM1>ZSWCCC]

Course

Field of study
Mechanical Engineering

Year/Semester
2/3

Area of study (specialization)
Machine Design

Profile of study
general academic

Level of study
second-cycle

Course offered in
polish

Form of study
part-time

Requirements
compulsory

Number of hours

Lecture
0

Laboratory classes
12

Other (e.g. online)
0

Tutorials
0

Projects/seminars
12

Number of credit points

2,00

Coordinators

Lecturers

Prerequisites

Students have a fundamental knowledge in the field of information technology, knowledge of manufacturing technology and the application of CAD CAM systems. Students are able to develop a model of the product using 3D CAD and to design the production process of the product. Students understanding of the need to learn and acquire new knowledge

Course objective

The aim of the course is to familiarize students with the advanced applications of integrated CAD/CAM/ CAE computer systems to support the design and manufacture of products in the manufacturing company.

Course-related learning outcomes

Knowledge:
Students have an extensive knowledge of engineering software systems to support the design and manufacturing of products in the enterprise. Students describe 3D geometric modelling methods, model visualization methods and models for virtual product testing and production planning. Students describe the capabilities of modern computer-aided engineering systems for virtual prototyping.

Skills:
Students are able to prepare a geometric 3D model of complex machine parts and assembly model using

models of components and subassemblies, develop models for CAM manufacturing modules. Students develop part programs for CNC turning and milling machines using integrated CAM module. Students are able to perform numeric analysis of structures and kinematic simulations using CAD/CAM/CAE integrated packages.

Social competences:
Students are prepared for implementation of information technology in engineering tasks. Students are able to develop his own knowledge on the subject. They can work in a design team using computer systems for engineering support.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

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Laboratories
Forming rating:
On the basis of an assessment of the current progress of tasks.
Summary rating:
Student preparation for laboratory classes and assessment of skills acquired during laboratory exercises will be verified on the basis of individually performed tasks at the computer workstation, oral answers and written tests on the ability to use studied software tools and design methods.
Project
Forming rating:
On the basis of an assessment of the current progress of project.
Summary rating:
Evaluation of individually performed design tasks.

Programme content

Laboratory classes:
1. Solid and hybrid modelling in the Catia integrated system.
2. Assembly modeling principles. Define constraints for parts in an assembly. The use of libraries and databases of typical elements.
3. Kinematic simulations of mechanisms.
4. Methodology of using the virtual model for engineering calculations and simulations.
5. Design of part manufacturing using CATIA Machining module.
Design classes:
Design of selected product under the guidance of the class leader using an integrated CAD/CAM/CAE system.

Teaching methods

Laboratory exercises:
Practical exercises, performing tasks at a computer workstation, designing the product, virtual product testing and manufacturing design in the CATIA v5 system.
Design classes:
Project consultation. Implementation of the project at computer workstation in the integrated CAD/CAM/CAE system.

Bibliography

Basic
1. Michaud M., CATIA. Narzędzia i moduły, Helion, Gliwice 2014
2. Wełyczko A., CATIA V5, Przykłady efektywnego zastosowania systemu w projektowaniu mechanicznym, Helion, Gliwice 2005
3. Pobożniak J., Programowanie obrabiarek sterowanych numerycznie w systemie CAD/CAM CATIA V5, Helion 2014
Additional
1. Dokumentacja system CATIA v5
2. Skarka W., CATIA V5. Podstawy budowy modeli autogenerujących, Helion, Gliwice 2009
3. Przybylski W., Deja M., Komputerowo wspomagane wytwarzanie maszyn. Podstawy i zastosowanie.

Breakdown of average student's workload

	Hours	ECTS
Total workload	65	2,00
Classes requiring direct contact with the teacher	26	1,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	39	1,00