COURSE DESCRIPTION CARD - SYLLABUS

Course name
Computer graphics [N1MiBP1>GK]

Course

Field of study
Mechanical and Automotive Engineering

Year/Semester
1/2

Area of study (specialization)
–

Profile of study
general academic

Level of study
first-cycle

Course offered in
polish

Form of study
part-time

Requirements
compulsory

Number of hours

Lecture
18

Laboratory classes
18

Other (e.g. online)
0

Tutorials
0

Projects/seminars
0

Number of credit points

4,00

Coordinators

dr hab. inż. Przemysław Tyczewski
przemyslaw.tyczewski@put.poznan.pl

Lecturers

dr inż. Tomasz Rochatka
tomasz.rochatka@put.poznan.pl

dr hab. inż. Przemysław Tyczewski
przemyslaw.tyczewski@put.poznan.pl

Prerequisites

Students beginning the course have to be able to use the Windows operating system and Microsoft Office. Students should have a mastery of technical drawing knowledge. The student has to be able to use computer equipment efficiently. The student has to have the ability to use network resources, and also to use information from various engineering disciplines to solve engineering practice issues. The student has to be able to divide a task into subtasks to be completed by the members of the project team. The student has to be able to solve the assigned tasks and carry out variant solutions on his/her own.

Course objective

To consolidate students" knowledge of classical construction notation of parts and assemblies. Acquiring skills of making 2D and 3D technical documentation with the use of computer-aided construction recording systems. Mastering the ability to conduct computer simulations. Use of tools enabling visualisation of designed products with the use of professional computer-aided design systems. Harmoniously linking computer techniques with the knowledge of classical construction notation.

Course-related learning outcomes

Knowledge:
Has basic knowledge of the standardized rules of recording structures and engineering graphics.
Has elementary knowledge of the basics of computer science, i.e. computer architecture, binary, decimal and hexadecimal counting system, representation of numbers and graphic characters in computer memory, variable types, general knowledge of low, medium and high level languages used in computer programming, operating systems , databases, RAD development environments, and typical engineering applications.
Has basic knowledge of manufacturing techniques used in the engineering industry, such as casting, forming, reducing and incremental machining, welding and other joining techniques, cutting, coating and surface treatments.

Skills:
Can use popular packages for editing technical drawings and 3D modeling to the extent enabling the creation of drawing documentation in accordance with applicable drawing standards and models of virtual machines in three-dimensional space.
2. Can prepare a technical descriptive and drawing documentation of an engineering task.
3. Can prepare and present a short verbal and multimedia presentation devoted to the results of an engineering task.

Social competences:
Is ready to recognize the importance of knowledge in solving cognitive and practical problems and to consult experts in case of difficulties in solving the problem on his own.
2. Is ready to fulfill social obligations and co-organize activities for the benefit of the social environment.
3. Is willing to think and act in an entrepreneurial manner.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Learning outcomes presented above are verified as follows:
In laboratory during the following classes, performing tasks indicated by the instructor. Following discussion within the group on accepted ways of solving tasks. Credit of the laboratory on the basis of the 2D and 3D modelling tasks. Credit of the lecture on the basis of the answers to open questions.

Programme content

The lectures cover: historical background of CAD systems, raster graphics, vector graphics, 3D graphics, application areas of CAD, CAM, CAE. The place of computer graphics in Computer Integrated Manufacturing CIM. Practical learning about the possibilities of parameterization, adaptability, variants in professional CAD systems. During the laboratory classes, the realization of the design process of the product in 3D through the preliminary design, 3D model, 2D documentation, assembly of the group, animation of the product operation. In this laboratory you will learn about the functionality of 3D CAD by using geometric constructions to draw panel type parts, making documentation using rectangular projection, dimensioning, generating cross sections, layouts. Getting to know possibilities of parameterization in 3D system. Modeling of elements and assemblies. Technical documentation, associativity of 3D/2D models. Modeling of sheet metal and welded structures. Designing teams using adaptability. Animation, visualization of parts and assemblies. Dynamic simulation of mechanisms. Practical learning of the principles of graphical information exchange between CAx systems.

Teaching methods

Multimedia presentation, individual and team project tasks.

Bibliography

Basic
1. Krawiec Piotr (red.), Grafika komputerowadla mechaników (wyd. VI zmienione i rozszerzone) wyd. Politechniki Poznańskiej, 2020.
2. Foley J., Dam A., Hughes J., Phillips R., Wprowadzenie do grafiki komputerowej, Warszawa, WNT 2001.

Additional
1. Krawiec Piotr (red.), Grafika komputerowa (wyd. V rozszerzone) wyd. Politechniki Poznańskiej, 2011
2. Zbiór ćwiczeń, Autodesk® Inventor® 2018: kurs professional / Fabian Stasiak. Ekspert Books, 2018.
3. Kiciak P., Podstawy modelowania krzywych i powierzchni: zastosowania w grafice komputerowej,
Warszawa, WNT 2000.

Breakdown of average student's workload

	Hours	ECTS
Total workload	100	4,00
Classes requiring direct contact with the teacher	36	2,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	64	2,00