COURSE DESCRIPTION CARD - SYLLABUS

Course name
CAD systems [S1IBio1E>SCAD]

Course

Field of study
Biomedical Engineering

Year/Semester
1/2

Area of study (specialization)
–

Profile of study
general academic

Level of study
first-cycle

Course offered in
English

Form of study
full-time

Requirements
compulsory

Number of hours

Lecture
0

Laboratory classes
45

Other
0

Tutorials
0

Projects/seminars
0

Number of credit points

4,00

Coordinators

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Lecturers

Prerequisites

The student has knowledge of technical drawing, engineering graphics. He can think logically, uses information obtained from engineering graphics, is able to operate computer equipment. Is aware of the need to learn and acquire new knowledge.

Course objective

The aim of the course is to acquaint the student with the issues of computer-aided design, application of CAD systems.

Course-related learning outcomes

Knowledge:
The student knows the main forms of graphic recording of construction, methods of graphic mapping, projection, drawing cross-sections, dimensioning, graphic recording of structural connections, recording of elements of complex technical systems. The student knows the functions of 2D and 3D modeling programs, can replace the geometric elements used in the software, knows the editing functions used in CAD systems. The student knows the tools of precise drafting and simulation of machining in computer systems.

Skills:
The student knows how to use the techniques of precise drafting, editing of geometric elements in 2D and 3D CAD software. The student knows how to make 2D and 3D design documentation of parts and products using computer tools.

Social competences:
The student is able to independently develop knowledge of the subject. The student is aware of the importance of modern information technologies in design.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

The knowledge and skills acquired during the laboratories will be verified on the basis of a mid-term colloquium and the last class during the semester at the computer station. Tests consist of 2 practical tasks. Passing threshold 50%.

Programme content

Lab:
Getting to know computer aided design systems, basic drawing operations, techniques of precise drawing of objects, creating flat documentation in 2D systems. Getting to know the geometric elements for creating documentation in 2D. Modifying objects, circular pattern, rectangular pattern, mirror, hatching, applying layers, various types of drawing lines, creating geometric constraints. Libraries of standard parts, detailed drawings and assembly drawings. Creation of drawing blocks, title blocks, parts lists. Understanding computer-aided design and modeling systems in 3D systems. Creation of the product tree. Object modification, circular pattern, rectangular pattern, mirror. The way of representing drawings and spatial models. The way of representation of solid models. Learning about geometric elements for creating models in 3D. Independent modeling in computer graphics, issuing and executing commands, modifications, dimensioning sketches, creating geometric constraints. Independent creation of single 3D models using various methods. Create assemblies from single parts, simulate assembly, simulate disassembly, give motion between dependent and related parts. Collision detection between parts. Creation of flat technical documentation based on single spatial models. Creation of flat technical documentation on the basis of complex models. Create a BOM parts list. Possibility of using CAD models for other computer-aided manufacturing systems, engineering calculations, rapid prototyping.

Course topics

none

Teaching methods

Laboratory: practical exercises at a computer station with the use of specialized software for 2D and 3D modeling, solving tasks, discussion.

Bibliography

Basic:
Dobrzański T., Engineering drawing, WNT, Warsaw, 2020
Weiss Z., Computer techniques in an enterprise, Poznan University of Technology, Poznań, 2002
Chlebus E., CAx computer techniques in production engineering, WNT, Warsaw, 2000

Additional:
Pikoń A., AutoCAD 2020 PL. First Steps, Helion Publishing House, Gliwice, 20019
Jaskulski A., Autodesk Inventor 2020 PL / 2020+, PWN, Warsaw 2020

Breakdown of average student's workload

	Hours	ECTS
Total workload	100	4,00
Classes requiring direct contact with the teacher	45	2,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	55	2,00