COURSE DESCRIPTION CARD - SYLLABUS

Course name
Basics of engineering design - CAD [S1IBiJ1>PPI]

Course

Field of study
Safety and Quality Engineering

Year/Semester
2/3

Area of study (specialization)
–

Profile of study
general academic

Level of study
first-cycle

Course offered in
Polish

Form of study
full-time

Requirements
compulsory

Number of hours

Lecture
15

Laboratory classes
30

Other
0

Tutorials
0

Projects/seminars
0

Number of credit points

3,00

Coordinators

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Lecturers

Prerequisites

Basic information from high school in the field of geometry and technical drawing.

Course objective

To acquaint students with the most important information in the field of Computer Aided Design (CAD), taking into account the principles of engineering graphics. Based on the information from the machine drawing, familiarization with electrical, architectural and construction drawings and machine construction. Acquiring the ability to create and read a technical drawing.

Course-related learning outcomes

Knowledge:
1. He is able to demonstrate professionalism and follow the principles of professional ethics, promoting respect for diversity and building a culture of safety and quality [K1_W06].
2. He knows the fundamental dilemmas of modern civilization and development trends as well as the best practices in the field of security engineering [K1_W10].
3. He knows at an advanced level the methods, techniques, tools and materials used in preparation for conducting scientific research and solving simple engineering tasks with the use of information

technology, information protection and computer support [K1_W11].

Skills:
1. Can use analytical, simulation and experimental methods to formulate and solve engineering tasks (design), also with the use of information and communication methods and tools [K1_U04].
2. Is able to critically analyze and optimize existing technical solutions to increase the quality and safety of machines, devices, facilities, systems, processes and services [K1_U06].
3. Can identify changes in requirements, standards, regulations and technical progress and the reality of the labor market, and on their basis define the need for supplementing knowledge [K1_U12].

Social competences:
1. Is aware of the recognition of the importance of knowledge in solving problems in the field of safety engineering and continuous improvement [K1_K02].
2. Is aware of responsibility for their own work and readiness to submit to the principles of teamwork and responsibility for jointly performed tasks [K1_K07].

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Formative assessment:
a) for the laboratory: on the basis of the assessment of the current progress in the implementation of laboratory tasks from the technical drawing
b) in the field of lectures: on the basis of answers to questions about the material covered in previous lectures
Summative assessment:
a) in the field of laboratories: credit in the form of making technical drawings from the program content
b) in the field of lectures: credit in the form of a selection test
The student receives a pass after receiving 51% of the points

Programme content

The subject program includes the following topics: a) engineering graphics: types of drawings, sheet formats, types and arrangement of views, dimensioning, elements of electrical and architectural drawings; b) AutoCAD: structure and communication with the program, dimensioning and drawing description.

Course topics

The course program covers the following topics: a) engineering graphics: types of drawings, sheet formats, standardized elements of a technical drawing, types and arrangement of projections, views and sections, dimensioning, tolerance of dimensions and shape and position, determination of surface roughness and waviness, connections of machine parts, axles, shafts, bearings, clutches and brakes. Drawing and reading diagrams: mechanical, hydraulic, pneumatic, thermal energy and vacuum techniques, elements of electrical, chemical, architectural and construction drawing. Drawings: executive drawings, assembly drawings, charts and nomograms; b) AutoCAD: construction and communication with the program, properties and modifications of drawing elements, introducing drawing elements, dimensioning and drawing description, creating text and tables, creating blocks, page and print settings, creating a 2D drawing, creating basic and advanced solid models.

Teaching methods

Lecture: Monographic lecture with the use of a computer with the division of the program content into separate thematic issues in connection with the thematic scope of the exercises. The method of exposing in the form of a show.
Laboratories: Laboratory method with elements of a demonstration method and talks according to the program content.

Bibliography

Basic:
Józef Gruszka, Kamil Wróbel, Adam Radecki (2022), Zarządzanie doborem narzędzi inżynierskiej grafiki komputerowej w projektowaniu ergonomicznym, Monografia (w opracowaniu), Wydawnictwo

Politechniki Poznańskiej.
Tadeusz Dobrzański (2019), Rysunek techniczny maszynowy, Wydawnictwo Naukowe PWN.
Andrzej Jaskulski (2020), AutoCAD 2021PL/EN/LT+ : metodyka efektywnego projektowania parametrycznego i nieparametrycznego 2D i 3D, Helion.
Andrzej Pikoń (2019), AutoCAD 2020 PL : pierwsze kroki, Helion.
Zakres aktualnych aktów normatywnych z zakresu rysunku technicznego.

Additional:
Fabian Stasiak (2017), AutoCA ® LT 2018 w projektowaniu mechaniki; ExpertBooks.
Kossakowski, Paweł (2017), Modelowanie żelbetowych elementów konstrukcyjnych w programie Autodesk Autocad Structural etailing 2015, Wydawnictwo Politechniki Świętokrzyskiej.
Molasy R., Rysunek techniczny : chropowatość i falistość powierzchni, tolerancje geometryczne i tolerowanie wymiarów, Wydawnictwo Politechniki Świętokrzyskiej, Kielce, 2016.
Piotr Agaciński (2014), Grafika inżynierska, Politechnika Poznańska. Wydawnictwo Politechniki Poznańskiej, Poznań 2014.

Breakdown of average student's workload

	Hours	ECTS
Total workload	75	3,00
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)	30	1,00