



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Basics of engineering design - CAD

### Course

Field of study

Safety Engineering

Area of study (specialization)

Level of study

First-cycle studies

Form of study

part-time

Year/Semester

2/3

Profile of study

general academic

Course offered in

Polish

Requirements

compulsory

### Number of hours

Lecture

15

Tutorials

Laboratory classes

30

Projects/seminars

Other (e.g. online)

### Number of credit points

3

### Lecturers

Responsible for the course/lecturer:

Ph.D., Eng. Kamil Wróbel

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Faculty of Engineering Management

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Responsible for the course/lecturer:

### 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

He knows advanced engineering issues (physics, chemistry, materials science, manufacturing technologies, strength of materials, mechanics) [K1\_W01].

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].

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

Can use analytical, simulation and experimental methods to formulate and solve engineering tasks, also with the use of information and communication methods and tools [K1\_U04].

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

Is aware of the recognition of the importance of knowledge in solving problems in the field of safety engineering and continuous improvement [K1\_K02].

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



## Programme content

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 doбором 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<sup>®</sup> LT 2018 w projektowaniu mechaniki; ExpertBooks.

Kossakowski, Paweł (2017), Modelowanie żelbetonowych 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	90	3,0
Classes requiring direct contact with the teacher	45	2,0
Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation) <sup>1</sup>	45	1,0

<sup>1</sup> delete or add other activities as appropriate