COURSE DESCRIPTION CARD - SYLLABUS

Course name
Engineering graphics and CAD [S1ETI1>GIiCAD]

Course

Field of study
Education in Technology and Informatics

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
full-time

Requirements
compulsory

Number of hours

Lecture
26

Laboratory classes
30

Other (e.g. online)
0

Tutorials
0

Projects/seminars
0

Number of credit points

4,00

Coordinators

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Lecturers

Prerequisites

1) Basic knowledge of elementary geometry and stereometry, knowledge in the area of computer science. 2) The ability to solve problems based on the already possessed knowledge; the skill to search for specific information in certain sources. 3) Understanding the necessity to broaden own knowledge and to shape new skills; self-reliance and perseverance in completing tasks and problem solving.

Course objective

1) To shape the students" spatial ability, and to familiarize them with the principles of representing spatial obejcts on a plane. 2) To develop the students" skills in preparing documentation drawings by using software tools; to shape their skills in reading technical drawings. 3) To introduce the students to the field of computer-aided design (CAD).

Course-related learning outcomes

Knowledge:

1) the student has well-structured knowledge on the principles of technical drawing - [k1_w09]
2) the student understands the importance of normalization in engineering graphics, and the role of cad software in engineering - [k1_k09]
3) the student understands the primary role of an engineer in the computer-aided preparing of technical drawings - [k1_k18]

Skills:
1) the student can draw basic structural components and use dimensions - [k1_u06]
2) the student can use cad software for drafting - [k1_u09]
3) the student can use the information communication technologies to complete the typical engineering tasks - [k1_u13]
4) the student has the ability of self-study - [k1_u02]

Social competences:
1) the student can work individually on assigned task - [k1_k01]
2) the student understands the need for lifelong learning - [k1_k03]

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Learning outcomes presented above are verified as follows:
Lecture: a written exam consisting of 5 equally scored, theoretical open-response questions.
Computer laboratory classes: three tests of drawing skills during the semester.
Assessment rules: a grade given on the basis of the obtained scores; linear grading scale; C grade for earning at least 50% of all points.

Programme content

Basics of preparing technical documentation - technical drawing.
Projection, cross-sections, dimensioning, normalization in technical drawing. CAD in engineering. The role and use of CAD in creating technical documentation.

Course topics

Lectures:
The principle of operation of screen editors.
Construction of a task in the CAD system language.
CAD system architecture.
Associative geometry in the CAD system.
A method for internal computer description of construction objects.
Possibilities of parameterization, adaptability, variants in professional
CAD systems.
Exchange of graphic information between CAX systems
Introduction to engineering graphics. Normalization in technical drawing. CAD in engineering.
Fundamental elements of technical drawing: standard sheets, drawing scales, drawing lines, technical lettering, title blocks.
Geometric constructions.
Axonometric projection. Orthographic projection with a use of the European method.
Edges of sliced solids. Intersection of solids.
Section views: full sections, offset and aligned sections; half-sections; removed sections.
Special cases of views and section views: broken out sections; ribs in section; auxiliary views and partial views; conventional breaks; showing enlarged details.
Dimensioning: principles and conventions in practice.
Detail drawings of basic machine parts: shafts and sleeves.
Assembly and subassembly drawings.
Laboratories:
Classes 1-15 hours.

Preparing documentation - pencil drawings according to the following topics:
Axonometric projection. Orthographic projection with a use of the European method.

Edges of sliced solids. Intersection of solids.
Section views: full sections, offset and aligned sections; half-sections; removed sections.
Special cases of views and section views: broken out sections; ribs in section; auxiliary views and partial views; conventional breaks; showing enlarged details.
Dimensioning: principles and conventions in practice.
Detail drawings of basic machine parts: shafts and sleeves.
Assembly and subassembly drawings.
Classes 15-30
Getting to know the possibilities of computer-based preparation of technical documentation. Transfer of previously made drawings to a digital form using the software indicated by the teacher.

Teaching methods

Lecture: informational lecture, multimedia presentation, problem-based method.
Computer laboratory classes: problem-based method, project-based method.

Bibliography

Basic
1. Dobrzański T., Rysunek techniczny maszynowy. WNT, Warszawa 2013.
2. Bajkowski J., Podstawy zapisu konstrukcji. Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa 2011.
3. Pikoń A., AutoCAD 2018 PL: Pierwsze kroki. Helion, Gliwice 2017.
4. Krawiec Piotr (red.), Grafika komputerowa dla mechaników (wyd. VI rozszerzone i zmienione), wyd. Politechniki Poznańskiej, 2020.
5. Dudziak Marian, Krawiec Piotr, Wspomaganie projektowania i zapisu konstrukcji, Wydawnictwo PWSZ w Kaliszu, 2012.
Additional
1. Burcan J., Podstawy rysunku technicznego. WNT, Warszawa 2010.
2. Pikoń A., AutoCAD 2018 PL. Helion, Gliwice 2018.
3. Chang K.-H., Product Design Modeling using CAD/CAE. Elsevier, 2014.

Breakdown of average student's workload

	Hours	ECTS
Total workload	86	4,00
Classes requiring direct contact with the teacher	56	3,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	30	1,00