COURSE DESCRIPTION CARD - SYLLABUS

Course name
Engineering graphics [N1MiBM2>RTe]

Course

Field of study
Mechanical Engineering

Year/Semester
1/1

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
8

Laboratory classes
0

Other
0

Tutorials
32

Projects/seminars
0

Number of credit points

5,00

Coordinators

dr inż. Maciej Berdychowski
maciej.berdychowski@put.poznan.pl

Lecturers

dr inż. Maciej Berdychowski
maciej.berdychowski@put.poznan.pl

mgr inż. Weronika Wiatrowska
weronika.wiatrowska@put.poznan.pl

mgr inż. Aleksandra Świadek
aleksandra.swiadek@put.poznan.pl

Prerequisites

Knowledge: Basic knowledge of elementary geometry and stereometry. Basic knowledge of machinery and machine parts. Skills: Ability to solve problems based on knowledge, ability to obtain information from indicated sources. Social competences: Understanding the need to expand one's knowledge and develop skills, as well as independence and consistency in carrying out tasks and solving problems. Willingness to cooperate within a team.

Course objective

1. Mastering the basic rules for constructing images of spatial structures on a plane. Developing spatial imagination. Learning the methods and principles of construction recording. Acquiring practical skills in creating technical drawing documentation. Acquiring practical skills in interpreting ("reading") technical drawings. 2. Developing teamwork skills in students.

Course-related learning outcomes

Knowledge:
Has basic knowledge of standardized principles of construction recording and engineering graphics.

Skills:
1. Is able to prepare technical descriptive and drawing documentation of an engineering task.
2. Is able to draw a diagram and a simple machine element by hand in accordance with the principles of technical drawing.

Social competences:
1. Is aware of the social role of a technical university graduate, understands the need to formulate and provide the public with information and opinions regarding technological achievements.
2. Is ready to recognize the importance of knowledge in solving cognitive and practical problems and to seek the opinion of experts in case of difficulties in solving the problem independently.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lecture: Written exam in the form of open tasks and/or multiple choice test.
Assessment of the exercises: Assessment on the basis of works (drawings) made during the semester and on the basis of the final assessment (final test).

Programme content

Lectures:
Lecture 1:
Introductory information, normalization in construction notation. Storing drawing documentation - drawing management.
Methods of mapping three-dimensional objects on the drawing plane (axonometric and orthographic projection). Presentation of the external and internal structure of an object using views and cross-sections (types, applications). Representation of a cross-section of an object using layers.
Lecture 2:
Recording dimensions.
Dimensional tolerances in manufacturing drawings and fits in assembly drawings. Shape and position tolerances. Geometric structure of the GPS surface.
Lecture 3:
Principles of preparing technical documentation for assemblies of machine parts, manufacturing and assembly documentation, principles of circulation of construction documentation in projects.
Principles of preparing assembly documentation for detachable connections in machine construction and preparing manufacturing drawings of selected fasteners.
Lecture 4:
Preparation of technical documentation for permanent connections.
Principles of preparing technical documentation for characteristic types of machine parts - shafts.
Rules for preparing technical documentation for characteristic types of machine parts - wheels, bearings, seals, elastic elements, etc.
Exercises:
Exercises 1:
Introduction, basic principles of creating technical drawing documentation, sheet formats, drawing board, axonometric and orthographic projection.
Exercises 2-3:
Creating simple and complex cross-sections (multiple planes), cross-sections of symmetrical parts, local cross-sections, layers.
Exercises 4-5:
Dimensioning of machine parts. Dimensioning of elements: cuboid, axisymmetric (sleeve, shaft), flat,
Exercises 6:
Dimensioning of machine parts - tolerances and fits in technical documentation.
Exercises 7-8:
Drawing detachable connections - threaded and splined.
Exercises 9:
Technical drawing of the welded connection.

Exercises 10-11:
Drawing machine parts: spring, lever, body.
Exercises 12:
Drawing machine parts: shaft and gear.
Exercises 13:
Creating assembly documentation. Bearing node design.
Exercises 14:
Interpretation of technical assembly documentation - preparation of manufacturing drawings based on assembly documentation.
Exercises 15:
Basics of descriptive geometry - geometric constructions.
Exercises 16:
Exam.

Course topics

none

Teaching methods

Lecture: Multimedia presentation with examples drawn on the blackboard.
Exercises: performing tasks, problem method, project method.

Bibliography

Basic:
1. Dobrzański T., Rysunek techniczny maszynowy, WNT, W-wa 1997.
2. Lewandowski T., Rysunek techniczny dla mechaników, WSiP, W-wa 2009.
3. Bajkowski J., Podstawy zapisu konstrukcji, Oficyna Wyd. Polit. Warszawskiej, 2014
4. Figurski J., Popis St., Rysunek techniczny zawodowy w branży mechanicznej i samochodowej, WSiP, W-wa 2016.
5. Jankowski W. Geometria Wykreślna. Wydawnictwo P.P. 1999 r.
6. Korczak J., Prętki Cz. Przekroje i rozwinięcia powierzchni walcowych i stożkowych. Wydawnictwo P.P. 1999 r.
7. Loska J., Zbiór zadań ćwiczeniowych z rysunku technicznego, Wyd. Politechniki Śląskiej, Gliwice 1982
8. Bober A, Dudziak M., Zapis konstrukcji, PWN, W-wa 1999.

Additional:
1. Kurmaz L. W., Kurmaz O. L., Podstawy Konstruowania węzłów i części maszyn: podręcznik konstruowania, Wydawnictwo Politechniki Świętokrzyskiej, Kielce 2011r.
2. Mały Poradnik Mechanika T. 2: Podstawy Konstrukcji Maszyn, Maszynoznawstwo, Wydawnictwa Naukowo-Techniczne, Warszawa 1994r.
3. Poradnik Mechanika, Wydawnictwo REA, Warszawa 2020r.

Breakdown of average student's workload

	Hours	ECTS
Total workload	125	5,00
Classes requiring direct contact with the teacher	40	1,50
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	85	3,50