



COURSE DESCRIPTION CARD - SYLLABUS

Course name

Engineering Graphics [S1FT2>GI]

Course

Field of study

Technical Physics

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

15

Laboratory classes

30

Other (e.g. online)

0

Tutorials

0

Projects/seminars

15

Number of credit points

5,00

Coordinators

dr hab. inż. Michał Śledziński

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Lecturers

Prerequisites

Basics of engineering. Elementary knowledge of the construction and operation of machines and devices. Preparation of classic technical documentation. Basic knowledge of Windows and Microsoft Office.

Course objective

Understanding the principles of graphic design of construction in a rectangular and axonometric throws arrangement. Shaping spatial imagination and skills to perform and read technical drawings. Getting acquainted with the methodology for building three-dimensional models in the CAD system, familiarize with the procedures for performing 2D and 3D documentation in the CAD system.

Course-related learning outcomes

Knowledge:

1. The student knows the principle of graphic design of construction, rectangular and axonometric throws and drawing layers and cross-sections and performing technical documentation.
2. The student identifies drawing simplifications and can choose standardized elements.
3. The student knows the principles of dimensioning, tolerances and passages.
4. The student knows the construction procedures for CAD 3D models.

5. The student knows the procedure for generating 2D and 3D technical documentation and simulations in CAD 3D systems.

Skills:

1. The student solves graphic tasks requiring spatial imagination in rectangular and axonometric projections.
2. The student performs connection drawings and some machine components: machine shafts, sleeves, levers, gears housings, etc..
3. The student performs assembly and working drawings. He can perform dimensioning of the elements according to the technology of execution.
4. The student can choose proper standardized elements.
5. The student design the elements and simple assemblies of machines in CAD 3D systems.
6. The student performs assembly and disassembly simulations and simulations of the functioning of selected machine assemblies.
7. The student generates production documentation in the CAD system.

Social competences:

1. The student can think creatively and innovatively. It learns from its mistakes.
2. The student recognizes the impact of knowledge and professional development on the level of their life and society.
3. The student can think pro-ecologically.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lecture: Assessment of knowledge and practical skills on written exam. Projects: Current assessment of sketches on classes. Periodic checking and assessment of technical drawings. Test of knowledge of rules and practical skills for solving drawing tasks. Evaluation of an individual project. Credit a laboratory based on the effects of work and practical test.

Programme content

- 1) Graphical representation of constructions
- 2) diagrams and mechanical schematics
- 3) Orthographic and axonometric projections
- 4) Views and sections
- 5) Drawing simplifications and standardised elements
- 6) Dimensioning, tolerances, and fits
- 7) Surface finish indications
- 8) Technical documentation

Course topics

Lecture programme covers the following topics:

- 1) Standardised elements of machine technical drawings and their applications
- 2) Types of graphs, principles of their development, drawing lines and scales
- 3) Layout of orthographic projections, principles of selecting the principal view
- 4) Types of axonometric projections, coordinate axis layout, representation of machine components
- 5) Types of sections, their marking and hatching, principles of creating sections of symmetrical, partial, and auxiliary objects
- 6) Principles of creating removed and revolved sections, their types and applications
- 7) Simplified drawings illustrating connections and machine parts and assemblies
- 8) Standardised elements and principles of their selection
- 9) General and ordinal principles of dimensioning. Dimension bases. Dimensioning of machine elements. Examples of dimensioning various shapes. Dimensioning of machine parts
- 10) Principles of dimension tolerance, shape and position deviations, fittings, and methods of their marking on drawings
- 11) Marking and symbols of the surface roughness
- 12) Principles of technical documentation development and creation of assembly and detailed drawings

Project programme covers the following topics:

- 1) Drawing solids and machine elements in orthographic and axonometric projections
- 2) Drawing objects in sections on assembly and detailed drawings, including dimensioning, shape and position tolerance annotation, and surface roughness symbols
- 3) Drawing simplified connections and machine assemblies
- 4) Utilising standards and catalogues and selecting standardised elements

Teaching methods

Lecture: Illustrated presentation with examples given on a blackboard, solving tasks.

Laboratory classes: practical exercises, documentation, discussion, teamwork.

Project classes: Individual work on of the student's design, discussion.

Bibliography

Basic:

1. Bajkowski J.: Podstawy zapisu konstrukcji. Wydawnictwo Politechniki Warszawskiej 2018.
2. Bajkowski J., Bajkowski J. M.: Podstawy zapisu konstrukcji. Materiały do ćwiczeń projektowych. Zadania z rozwiązaniami. Wydawnictwo Naukowe PWN 2019
3. Dobrzański T.: Rysunek techniczny maszynowy. PWN Warszawa 2019.
4. Lewandowski T.: Rysunek techniczny dla mechaników. WSiP Warszawa 2018
5. Foley J., Dam A., Hughes J., Phillips R.: Wprowadzenie do grafiki komputerowej, Warszawa, WNT 2001.
6. Jankowski M.: Elementy grafiki komputerowej, WNT Warszawa 1990.
7. Krawiec P. (red): Grafika Komputerowa - laboratorium. Wydawnictwo Politechniki Poznańskiej Poznań 2011.

Additional:

1. Bober A., Dudziak M.: Zapis konstrukcji. PWN Warszawa 1999.
2. Giełdowski L.: Rzutowanie prostokątne. Widoki. Ćwiczenia i zadania rysunkowe WSiP 1998.
3. Giełdowski L.: Rysunek techniczny. Przekroje. WSiP 2010.
4. Giełdowski L.: Wymiarowanie. Ćwiczenia i zadania rysunkowe, WSiP 1999.
5. Osiński J.: Wspomagane komputerowo projektowanie typowych zespołów i elementów maszyn. Warszawa, PWN 1994.

Breakdown of average student's workload

	Hours	ECTS
Total workload	125	5,00
Classes requiring direct contact with the teacher	60	2,50
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	65	2,50