COURSE DESCRIPTION CARD - SYLLABUS

Course name
Engineering graphics [S1IBio1>GI]

Course

Field of study
Biomedical 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
full-time

Requirements
compulsory

Number of hours

Lecture
15

Laboratory classes
0

Other
0

Tutorials
15

Projects/seminars
15

Number of credit points

3,00

Coordinators

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Lecturers

Prerequisites

Knowledge: the student has basic knowledge of elementary geometry. Skills: the student possesses the ability to acquire information and correctly select its sources, spatial imagination, and the ability to draw simple geometric figures. Social competences: the student understands the need for self-education, is able to interact in a group and define tasks and priorities for their implementation.

Course objective

Passing on the knowledge of the fundamentals of engineering graphics covered by the program content, acquisition of skills of shaping and developing spatial imagination, practical creation of technical drawing documentation.

Course-related learning outcomes

Knowledge:
Students have the knowledge to record the construction in engineering graphics in accordance with the rules (standards).

Skills:

Students have the ability to self-learn, among other things to improve his/her professional competence.
Students can reproduce and dimension machine elements and apply other elements of drawing documentation.

Social competences:
Students understand the need for lifelong learning; can inspire and organise the learning of others.
Students can interact and work in a group, assuming different roles.
Students can identify priorities for achieving a specific task or tasks.
Students can correctly identify and resolve professional dilemmas.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Learning outcomes presented above are verified as follows:
Written examination of lecture consists of two stages and four parts. First stage, which includes parts one and two, takes place mid semester, whereas second stage, consisting of parts three and four, takes place at the end of the semester. Each part is graded using point scale, the number of points sufficient to pass equals 50% of total score.
Continuous monitoring and grading of exercises using point scale. To pass the tutorial part of the course it is required to acquire at least 50% of total score awarded for exercises.
Continuous control and final grading of the project using point scale. To pass the projects part of the course it is required to acquire at least 50% of total score that is possible to achieve.

Programme content

Introduction: graphical communication technique, standardized elements of the construction record. (1) Recording of geometric form of machine elements: rectangular projection, views, cross-sections, layouts. (2) Recording of the dimensional system: graphical form, rules of arrangement, dimensioning of geometrical elements of the object, general dimensioning rules, dimensioning rules resulting from construction, measurement and technological needs. (3) Simplifications in recording the construction: drawing of threads, splines and threaded, spline, welded, soldered, glued connections, drawing of springs, gears, seals and bearings. (4) Recording of surface condition: tolerances, fits, tolerance of shape and position, roughness, heat treatment and coating marks. (5) Analysis and correct interpretation of assembly drawings. (6) Development directions of creating technical documentation based on direct writing of necessary information in 3D model (Model-Based Definition).

Course topics

Lectures:
1. Graphic communication techniques, standardized elements of engineering drawing notation. Recording the geometric form of machine components: orthographic projection.
2. Recording the geometric form of machine components: views, cross-sections, and revolved sections. Recording dimension layouts: graphical form, arrangement principles, dimensioning of geometric elements of a part.
3. Recording dimension layouts: dimensioning of geometric elements of a part, general dimensioning principles, dimensioning principles arising from design, measurement, and technological requirements. Directions of development in technical documentation on the example of direct recording of required information in a 3D model (Model-Based Definition).
4. Colloquium covering the recording of geometric form and dimension layouts. Continued lecture: simplifications in engineering notation: drawing threads, splines, and threaded and splined connections.
5. Simplifications in engineering notation: drawing welded, soldered, and adhesive joints, drawing springs, gears, seals, and bearings.
6. Recording surface condition: tolerances, fits, geometric tolerancing of form and position, designation of surface texture, heat treatment, and coatings.
7. Colloquium covering simplifications in engineering notation and recording of surface condition.

Tutorials:
1. Correct interpretation of geometric features.
2. Fundamentals of projection and dimension notation.
3. Recording geometric features of rotational elements or those represented in a single view.

4. Recording geometric features using simple cross-sections.
5. Recording geometric features using complex cross-sections.
6. Recording geometric features using complex cross-sections – continued.
7. Assessment.

Projects:
1. Simplifications in engineering notation using the example of a threaded connection.
2. Recording geometric features of joints – splined connections.
3. Recording geometric features of welded assemblies – welding drawing.
4. Assembly drawing – gearbox node.
5. Detail drawing – shaft with gear wheel.
6. Detail drawing – shaft with gear wheel – continued.
7. Assessment.

Teaching methods

1. Lecture with multimedia presentation.
2. Tutorials - practical presentation of sample tasks supported by a multimedia presentation, drawing tasks.
3. Projects - independent creation of assembly drawings based on the workflow presented in examples using multimedia presentations.

Bibliography

Basic
1. Dobrzański T., Rysunek techniczny maszynowy, WNT, W-wa 2025.
2. Lewandowski T., Rysunek techniczny dla mechaników, WSiP, W-wa 2018.
Additional
1. Bober A, Dudziak M., Zapis konstrukcji, PWN, W-wa 1999, 2001.
2. Rydzanicz I., Rysunek techniczny jako zapis konstrukcji Zadania, WNT, Warszawa, 2009.

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