POZNAN UNIVERSITY OF TECHNOLOGY

COURSE DESCRIPTION CARD - SYLLABUS

Course name
Descriptive Geometry [S1IŚrod2>GW]

Course

Field of study	Year/Semester
Environmental Engineering	1/1

Area of study (specialization)	Profile of study
–	general academic

Level of study	Course offered in
first-cycle	Polish

Form of study	Requirements
full-time	compulsory

Number of hours

Lecture	Laboratory classes	Other (e.g. online)
15	0	0

Tutorials	Projects/seminars
15	0

Number of credit points

2,00

Coordinators	Lecturers
dr Marian Liskowski marian.liskowski@put.poznan.pl	

Prerequisites

Basic knowledge of the geometry defined by the core curriculum of mathematics education at the advanced level in secondary school.

Course objective

1. Equipment student's ability to visualize the spatial forms of an engineering and geometrical methods to solve some of the problems in the field of engineering. 2. Developing the capacity of spatial vision.

Course-related learning outcomes

Knowledge:
1. Students have knowledge of the principles of presenting spatial formations on a plane by means of projection onto two orthogonal viewports.
2. Students have knowledge of the rules for reading drawings obtained by the above method.
3. Students have knowledge of the principles of presenting spatial formations on a plane by means of axonometric projection.

Skills:

1. Students are able to present on the plane data explicitly or created imaginary geometric forms.
2. Students are able to imagine a spatial forms on the basis of flat image.
3. Students can construct intersections of planes with solids, intersections of surfaces and developments of surfaces and polyhedrons (pyramids and prisms).
4. Students are able to perform axonometric projections solid figures taken from the practice of engineering.

Social competences:
1. Students are aware of the importance of technical drawing as a way to communicate relevant technical sciences.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Knowledge acquired during lectures is verified by means of a test consisting of 10 questions.
Passing threshold: 60%.
Skills acquired during tutorials are verified on the basis of two tests.
Passing threshold: 55%

Programme content

1. Orthographic projections onto two mutually perpendicular planes.
2. Intersections of plane with solids. Developments.
3. Conics.
4. Intersections of surfaces. Cutting plane method. Sphere metod.
5. Axonometric projections.

Course topics

1. Orthographic projections onto two mutually perpendicular planes.
1.1 Views of a point.
1.2 Views of a straight line.

2. Intersections of plane with solids. Developments.
2.1 Intersections of planes
2.2 Intersection of plane and prism, intersection of plane and pyramid.
2.3 Intersection of plane and right-circular cylinder and obique cylinder.
2.4 Intersection of plane and right-circular cone.
2.5 Intersection of plane and oblique cone.
2.6 Development of pyramid and right-circular cone.
2.7 Development of prism, right-circular cylinder and oblique cylinder.

3. Conics. Definitions and constructions of the elipse, the parabola and the hyperbola.

4. Intersections of surfaces. Cutting plane method. Sphere method.
4.1 Intersection of right-circular cylinders.
4.2 Intersection of right cylinder and cone.
4.3 Intersection of cylinder (or cone) and sphere.

5. Axonometric projections.
5.1 Isometric projection
5.2 Dimetric projection.
5.3 Oblique projections (cavalier projection, military projection).

Teaching methods

Lecture: multimedia presentation supplemented by examples given on the board.
Tutorials: practical exercises supplemented with multimedia presentations. Solving tasks given by the teacher. Detailed reviewing of task solutions, discussions on solutions.

Bibliography

Basic:
1. B. Grochowski, Geometria wykreślna z perspektywą stosowaną, Wydawnictwo Naukowe PWN, 2010
2. A. Bieliński, Geometria wykreślna, Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa 2022

Additional:
1. W. Mierzejewski, Geometria wykreślna, Oficyna Wydawnicza Politechniki Warszawskiej, 2006
2. J. Korczak, Cz. Prętki, Przekroje i rozwinięcia powierzchni walcowych i stożkowych, Wydawnictwo Politechniki Poznańskiej, 2007

Breakdown of average student's workload

	Hours	ECTS
Total workload	50	2,00
Classes requiring direct contact with the teacher	30	1,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	20	1,00