GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Architectural geometry, PG_00052771
Field of study	Architecture

Date of commencement of studies	October 2022	Academic year of realisation of subject	2022/2023
Education level	first-cycle studies	Subject group	Obligatory subject group in the field of study
Mode of study	Full-time studies	Mode of delivery	at the university
Year of study	1	Language of instruction	Polish
Semester of study	2	ECTS credits	3.0
Learning profile	general academic profile	Assessment form	exam

Conducting unit	Faculty of Architecture

Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. arch. Anna Wancław
	Teachers	mgr inż. arch. Barbara Chomicka dr inż. arch. Anna Wancław mgr inż. arch. Michał Malewczyk

Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	0.0	15.0	0.0	30
	E-learning hours included: 0.0						

Learning activity and number of study hours	Learning activity	Participation in didactic classes included in study plan	Participation in consultation hours	Self-study	SUM
	Number of study hours	30	6.0	39.0	75

Subject objectives	The development of spatial vision and the ability to apply it in the architectural design, skills in using axonometric drawing and perspective.

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[K6_U04] is able to use analytical methods to formulate and solve project tasks	He is able to present the effects of work attractively, also using popular digital programs.	[SU5] Assessment of ability to present the results of task [SU4] Assessment of ability to use methods and tools [SU3] Assessment of ability to use knowledge gained from the subject
	[K6_W01] knows and understands construction problems, building and engineering issues related to building design; principles, solutions, constructions and building materials used in simple engineering tasks in the field of architectural and urban design	Correctly constructs and reads spatial objects (including curves and surfaces) in different types of projections, also using popular digital programs; with their help solves simple spatial problems.	[SW1] Assessment of factual knowledge

Subject contents	lectures:
	1. One-point perspective, circle in perspecrive
	2. Orthogonal perspective. Shadows in prespective
	3. Settings in digital perspective
	4. Regular and semi-regular polyhedrons and geodesic domes.
	5. Curves and their properties. Properties of digital curves.
	6. Surfaces and their properties. Surface classification. Construction of the surface. Piercing points.
	7, 8. Stage II surfaces and their cross-sections. Conical curves. Affinity relationship elipse with circle
	9. Straight and screw surfaces. Digitally surfaces. Methods of creation. Curves and "offset" surfaces
	10, 11. Intersection of surface. The vault.
	12. Computer modifications and surface transformations. Models and surface developments.
	13, 14. Sufraces in architecture.
	15. Review of issues. Preparation for the exam
	design:
	1. Horizontal projection - basic constructions, drawing
	2. Horizontal projection - a road project in the terrain (laboratory)
	3. One point perspective, the circle and shadow
	4, 5. Vertical perspective with shadow, homework - settings of digital perspective
	6, 7. (laboratory). Regular and semi-regular polyhedrons and geodesic domes
	8. TEST - roofs and shadow, horizontal projection, perspective.
	9. Construction of sufrace, piercing points
	10, 11. (laboratory) Ruled surfaces.
	12. conical cross-sections
	13. Intersection of surfaces
	14, 15 (laboratory) Surfaces - selected issues

Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Final exam	51.0%	50.0%
	Quality of drawings	100.0%	50.0%

Recommended reading	Basic literature	H. Pottmann, A. Asperl, M. Hofer, A. Kilian, *Architectural geometry*, Bentley Institute Press 2007
		Przyłucka K., Helenowska-Peschke M. *Wykłady z geometrii wykreślnej*; http://www.pg.gda.pl/~mhelen/w1/index.html
		Helenowska-Peschke M., Wancław A., *Zadania z geometrii wykreślnej.* http://pbc.gda.pl/dlibra/doccontent?id=2597
		Helenowska-Peschke M., Wancław A., Konstrukcje cieni, http://pbc.gda.pl/dlibra/doccontent?id=2566
	Supplementary literature	Górska R., *Geometria wykreślna,* Kraków 2015
		Otto F.E., *Geometria wykreślna,*
		Jankowski W., *Geometria wykreślna,*
		Grochowski B., *Geometria wykreślna z perspektywą stosowaną,*
		Bruzda J., *Szkice Perspektywiczne w architekturze,* Warszawa, 1971
		Romaszkiewicz-Białas T., *Perspektywa praktyczna dla architektów,* Wrocław, 1991
	eResources addresses	Adresy na platformie eNauczanie: Geometria dla architekta 2022/2023 - Moodle ID: 28566 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=28566

Example issues/ example questions/ tasks being completed	1. Constructs the perspetcive of a given plans of the objects and its shadow according to a given light ray.
	2. According to the given light ray construct the own shadow of a sphere and the shadw cast on the plane of the projection of the sphere
	3. According to the given light ray construct the common cast shadow of a sphere and torus
	4. According to the given light ray construct the shadow of the complex surface (surface combined from torus and hemisphere)
	5. Construct the interior shadow of cone according to the given light ray
	6. Create a ruled surface in parametric mode (Grasshopper)

Work placement	Not applicable