



## Subject card

Subject name and code	Architectural geometry, PG_00052771						
Field of study	Architecture						
Date of commencement of studies	October 2020		Academic year of realisation of subject		2020/2021		
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 Wanclaw				
	Teachers		dr inż. arch. Anna Wanclaw  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						
	Adresy na platformie eNauczanie: Geometria dla architekta 2020/21 - Moodle ID: 8621 <a href="https://enauczanie.pg.edu.pl/moodle/course/view.php?id=8621">https://enauczanie.pg.edu.pl/moodle/course/view.php?id=8621</a>						
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.		[SU3] Assessment of ability to use knowledge gained from the subject [SU4] Assessment of ability to use methods and tools [SU5] Assessment of ability to present the results of task		
	[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 perspective
2. Orthogonal perspective. Shadows in perspective
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 ellipse 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. Surfaces 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 surface, 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
	Test	51.0%	33.0%
	Final exam	51.0%	34.0%
	Quality of drawings	100.0%	33.0%
Recommended reading	Basic literature	H. Pottmann, A. Asperl, M. Hofer, A. Kilian, <i>Architectural geometry</i> , Bentley Institute Press 2007  Przyłucka K., Helenowska-Peschke M. <i>Wykłady z geometrii wykreślnej</i> ; <a href="http://www.pg.gda.pl/~mhelen/w1/index.html">http://www.pg.gda.pl/~mhelen/w1/index.html</a>  Helenowska-Peschke M., Wancław A., <i>Zadania z geometrii wykreślnej</i> . <a href="http://pbc.gda.pl/dlibra/doccontent?id=2597">http://pbc.gda.pl/dlibra/doccontent?id=2597</a>  <i>Helenowska-Peschke M., Wancław A., Konstrukcje cieni</i> , <a href="http://pbc.gda.pl/dlibra/doccontent?id=2566">http://pbc.gda.pl/dlibra/doccontent?id=2566</a>	
	Supplementary literature	Górska R., <i>Geometria wykreślna</i> , Kraków 2015  Otto F.E., <i>Geometria wykreślna</i> ,  Jankowski W., <i>Geometria wykreślna</i> ,  Grochowski B., <i>Geometria wykreślna z perspektywą stosowaną</i> ,  Bruzda J., <i>Szkice Perspektywiczne w architekturze</i> , Warszawa, 1971  Romaszkiewicz-Białas T., <i>Perspektywa praktyczna dla architektów</i> , Wrocław, 1991	
	eResources addresses	Geometria dla architekta 2020/21 - Moodle ID: 8621 <a href="https://enauczanie.pg.edu.pl/moodle/course/view.php?id=8621">https://enauczanie.pg.edu.pl/moodle/course/view.php?id=8621</a>	
Example issues/ example questions/ tasks being completed	1. Constructs the perspective 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 shadow 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		