



## Subject card

Subject name and code	, PG_00066183						
Field of study	Geodesy and Cartography						
Date of commencement of studies	February 2026	Academic year of realisation of subject			2025/2026		
Education level	second-cycle studies	Subject group					
Mode of study	Full-time studies	Mode of delivery			at the university		
Year of study	1	Language of instruction			Polish		
Semester of study	1	ECTS credits			2.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	Department of Geodesy -> Faculty of Civil and Environmental Engineering -> Faculties of Gdańsk University of Technology						
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Paweł Dąbrowski					
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	15.0	0.0	0.0	30
	E-learning hours included: 0.0						
	eNauczanie source addresses: Moodle ID: 4463 Technologie Geodezyjne w BIM 2025/2026 <a href="https://enauczanie.pg.edu.pl/2025/course/view.php?id=4463">https://enauczanie.pg.edu.pl/2025/course/view.php?id=4463</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	0.0		0.0	30	
Subject objectives	The student learns about the scope of using geodetic practice in the investment process and creating BIM models.						
	The student learns about the sources of obtaining archival and current geospatial data and learns about their integration.						
	The student learns about the methods of harmonizing geodetic and cartographic data and methods of converting reference systems.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	<p>[K7_W05] has a well-established knowledge of analytical methods and surveying techniques necessary for creating and solving a variety of problems in geodesy and cartography</p>	<p>Ability to use current and archival data from the state geodetic and cartographic resources</p> <p>Ability to convert spatial data in archival and current reference systems and planar coordinate systems</p> <p>Ability to harmonize spatial data from geodetic documentation and from measurements using terrestrial and airborne laser scanning technology</p>	<p>[SW1] Assessment of factual knowledge</p> <p>[SW3] Assessment of knowledge contained in written work and projects</p>
	<p>[K7_U06] creates solutions to complex and unstructured problems taking into account the variability of the environment by synthesising information from different sources, using analytical and simulation methods</p>	<p>Ability to identify sources of geodetic and cartographic data used in the investment process and creation of a BIM model</p> <p>Ability to obtain spatial data necessary in the investment process</p> <p>Ability to identify spatial data reference systems and their harmonization</p>	<p>[SU3] Assessment of ability to use knowledge gained from the subject</p>
<p>Subject contents</p>	<p>Course content – lecture</p> <p>The role and scope of geodetic work in the investment process and creation of BIM models</p> <p>Legal conditions for performing work for construction and BIM purposes</p> <p>Data structure of spatial information infrastructure</p> <p>Reference systems used in Poland</p> <p>Planar coordinate systems used in Poland</p> <p>Data transformation in different reference systems Working with data from the state geodetic and cartographic resource and from the geoportal</p> <p>Terrestrial and airborne laser scanning technology</p> <p>Methods of processing point clouds from terrestrial and airborne laser scanning</p> <p>Creating harmonized spatial data sets for BIM purposes</p> <hr/> <p>Course content – laboratory</p> <p>Transformation of PL-2000, PL-1992, UTM, 1965, 1942, and Gdańsk '70 coordinate systems Creating transformation software in Python Georeferencing of raster map scans, vectorization, and analysis of spatial data Registration, segmentation, and processing of point clouds, volumetric analyses</p>		
<p>Prerequisites and co-requisites</p>	<p>Knowledge of vector calculus and matrix algebra</p> <p>Knowledge of mathematical analysis and algebra</p>		

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
		50.0%	15.0%
		50.0%	40.0%
		50.0%	30.0%
		50.0%	15.0%
Recommended reading	Basic literature	Books:  Kazimierz Czarnecki - Geodezja współczesna, Wydawnictwo Naukowe PWN  Idzi Gajderowicz - Odwzorowania kartograficzne, Wyd. Uniwersytetu Warmińskiego - Mazurskiego  Andrzej Jagielski - Geodezja II, Wydawnictwo Stabil	
	Supplementary literature	Jan Panasiuk, Jerzy Balcerzak - Wprowadzenie do kartografii matematycznej, Oficyna Wyd. PPW  Paweł Pędzich - Podstawy odwzorowań kartograficznych z aplikacjami komputerowymi, Oficyna Wyd. PPW	
	eResources addresses		
Example issues/ example questions/ tasks being completed	Indication of the procedure for obtaining and transforming spatial data to a specific reference system  Indication of the procedure for harmonizing two-dimensional and three-dimensional data		
Practical activities within the subject	Not applicable		

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