

## GDAŃSK UNIVERSITY

## Subject card

Subject name and code	Geographic information systems, PG_00045320								
Field of study	Data Engineering								
Date of commencement of studies	October 2025		Academic year of realisation of subject			2027/2028			
Education level	first-cycle studies		Subject group			Optional subject group Subject group related to scientific research in the field of study			
Mode of study	Full-time studies		Mode of delivery			at the university			
Year of study	3		Language of instruction			Englis	English		
Semester of study	5		ECTS credits			4.0			
Learning profile	general academic profile		Assessment form			assessment			
Conducting unit	Department Of Geoinformatics -> Faculty Of Electronics Telecommunications And Informatics -> Wydziały Politechniki Gdańskiej								
Name and surname	Subject supervisor Teachers		dr hab. inż. Marcin Kulawiak						
of lecturer (lecturers)			dr hab. inż. Marcin Kulawiak						
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Projec	ject Seminar		SUM	
	Number of study hours	15.0	0.0	15.0	0.0		0.0	30	
	E-learning hours included: 0.0								
Learning activity and number of study hours	Learning activity	Participation ii classes includ plan	n didactic ed in study	Participation in consultation hours		Self-study		SUM	
	Number of study hours305.0		5.0	65.0			100		
Subject objectives	Teaching students the basic knowledge and practical skills in the field of Geographic Information Systems and spatial data, which includes both the use of GIS and programming components that implement the basic functions of GIS.								
Learning outcomes	Course out	come	Subject outcome			Method of verification			
	[K6_W01] identifies conditioning of the processes occurring in the analyzed systems and selects methods for solving them, using the accumulated knowledge and taking into account the mutual relations between the analyzed phenomena		The student has knowledge about the construction, structure and functionality of GIS and their applications, as well as about the sources, models and standard formats of spatial data and their processing methods.			[SW1] Assessment of factual knowledge			
	[K6_K03] demonstrates the ability to think critically and analytically and integrates knowledge from many disciplines in order to make effective decisions		The student is able to apply GIS tools to solve problems related to acquiring, processing and analyzing spatial information.			[SK5] Assessment of ability to solve problems that arise in practice			
	[K6_U07] uses information technologies to improve the acquisition, analysis and processing of data in business applications		The student programs using technologies, tools and libraries for processing spatial data.			[SU1] Assessment of task fulfilment			
Subject contents	Rehersal of the basics of GIS. Map attributes: scale, projection, coordinate system. Types of spatial data. Vector and Raster data formats. Three-dimensional data in GIS. Topological operations. Analysis of the electromagnetic spectrum. Raster data classification. Managing spatial data with Quantum GIS. Georectification of raster data in Quantum GIS. Creating a Web-based GIS in Open Layers. Three- dimensional GIS operations in the web environment using the Cesium library.								
Prerequisites and co-requisites									
Assessment methods and criteria	Subject passing criteria		Passing threshold			Percentage of the final grade			
	Lecture (Exam)		60.0%			50.0%			
	Laboratory		60.0%	60.0%			50.0%		

Recommended reading	Basic literature	Longley, P. A., Goodchild, M. F., Maguire, D. J., & Rhind, D. W. (2015). Geographic information science and systems. John Wiley & Sons.				
	Supplementary literature	S. Shekhar, H. Xiong (ed.), Encyclopedia of GIS. Springer, 2008				
	eResources addresses	Adresy na platformie eNauczanie:				
Example issues/ example questions/ tasks being completed	1. Algorithmic spatial analysis of raster data.					
	2. Geoprocessing and topological operations on vector data.					
	3. Building a custom Geographic Information System using computer programming tools.					
Work placement	Not applicable					

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