GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Geographic information systems, PG_00045320		
Field of study	Data Engineering		
Date of commencement of studies	October 2023	Academic year of realisation of subject	2025/2026
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	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		
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Marcin Kulawiak	
	Teachers	dr hab. inż. Marcin Kulawiak	

Lesson types and methods of instruction

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

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	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 outcome	Subject outcome	Method of verification
[K6_W03] Knows the applications of geoinformation systems, spatial data formats, methods of creating and analysing digital maps, architecture and services of satellite navigation systems.	The Student posesses knowledge about the structure and functionality of GIS and their applications, as well as the sources, models and standard spatial data formats and methods of its processing	[SW1] Assessment of factual knowledge
[K6_U01] programs in procedural, object, functional and logic programming languages, codes programs at the processor instruction level, runs and tests programs.	The student can program with the use of 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%	50.0%

Recommended reading	Basic literature	Longley P., Goodchild M., Maguire D., Rhind D. "Geographic Information Systems and Science", John Wiley & Sons Ltd., West Sussex 2005
	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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