Subject card

Subject name and code	Geographic information systems, PG_00045320
Field of study	Data Engineering

Date of commencement of studies	October 2024	Academic year of realisation of subject	2026/2027
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

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
	Laboratory	60.0%	50.0%
	Lecture (Exam)	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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