



Subject card

Subject name and code	Methods for acquisition and visualization of geodata, PG_00045749						
Field of study	Geodesy and Cartography						
Date of commencement of studies	February 2024	Academic year of realisation of subject			2023/2024		
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						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Grzegorz Nykiel				
	Teachers		dr inż. Grzegorz Nykiel				
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	10.0	10.0	0.0	0.0	0.0	20
	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	20		8.0		22.0	50
Subject objectives	The purpose of the course is to familiarize the student with the possibilities of using the Python programming language and publicly available data sources to acquire, visualize and analyze spatial data. Upon completion of the course, the student will be able to write simple scripts in Python for visualization and analysis of geodata.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K7_U10] can develop a thematic map using IT tools, use modern methods of geovisualisation within the selected software GIS environment, use the database in the thematic maps development.		The student is able to use the Python language to visualize the measurement data; can visualize the threedimensional model of terrain based on external data stored in the file; The student is able to use and analyze publicly available spatial data.		[SU4] Assessment of ability to use methods and tools [SU1] Assessment of task fulfilment		
	[K7_W14] has deep knowledge in the field of qualitative and quantitative methods of cartographic presentation, he knows methods of visualization of relief, graphic variables used to visualize geodata		The student is able to correctly select the visualization methods for the type of data. Knows the basic ways to generate a grid from measurement data.		[SW3] Assessment of knowledge contained in written work and projects [SW1] Assessment of factual knowledge		
Subject contents	1. Introduction to scripting languages2. Starting with Python3. Data and types of variables4. Matrices5. 2D charts6. 3D charts7. Interpolation8. Programming9. Functions and scripts10. I/O files11. Google Earth Engine i Climate Data Store (CDS) Toolbox						
Prerequisites and co-requisites	Knowledge in the field of mathematics, geodetic measurements, compensatory calculus and programming basics.						
Assessment methods and criteria	Subject passing criteria		Passing threshold		Percentage of the final grade		
	Practical exercises		80.0%		20.0%		
	Final test		80.0%		80.0%		

Recommended reading	Basic literature	<ul style="list-style-type: none"> • <i>Mark Lutz, Learning Python.</i> • <i>Qiusheng Wu, Earth Engine and Geemap - Geospatial Data Science with Python; https://book.geemap.org/index.html</i>
	Supplementary literature	<ul style="list-style-type: none"> • Wes McKinney; Python for data analysis • Jake VanderPlas; Python Data Science.
	eResources addresses	Adresy na platformie eNauczanie:
Example issues/ example questions/ tasks being completed		
Work placement	Not applicable	