GDAŃSK UNIVERSITY OF TECHNOLOGY

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 2023	Academic year of realisation of subject	2022/2023
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. Adam Inglot	
	Teachers	dr inż. Adam Inglot	

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 aim of the course is to familiarize the student with the possibilities of using Python\ArcGIS Pro scripting languages to acquire and visualize geodata. After completing the course, the student knows the basic functions available in Python\ArcGIS Pro, can correctly visualize measurement data in 2D and 3D space, knows the functions necessary to perform advanced visualizations and their editing.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[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.	[SW1] Assessment of factual knowledge [SW3] Assessment of knowledge contained in written work and projects
[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\ArcGIS Pro environment to visualize the measurement data; can visualize the three-dimensional model of terrain based on external data stored in the file; can apply various methods of generating a grid, interpolation of values, as well as presenting data in the form of a model. The student is able to correctly present measurement data in the form of charts.	[SU1] Assessment of task fulfilment [SU4] Assessment of ability to use methods and tools

Subject contents	1. Introduction to scripting languages 2. Starting with Python\ArcGIS Pro 3. Data and types of variables 4. Matrices 5. 2D charts 6. 3D charts 7. Interpolation 8. Programming 9. Functions and scripts 10. I/O files
Prerequisites and co-requisites	

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	Wendy L. Martinez, Angel R. Martinez, Computational Statistics Handbook with MATLAB, 3e. Chapman & Hall/CRC, 2016 Lutz, Mark, "Programming Python: Powerful Object-Oriented Programming." (2021).
Supplementary literature	Wendy L. Martinez, Angel R. Martinez, Jeffrey Solka,Exploratory Data Analysis with MATLAB, Second Edition (Chapman & Hall/CRC Computer Science & Data Analysis) 2nd Edition. CRC Press; 2 edition (December 16, 2010) Toms, Silas. ArcPy and ArcGISGeospatial Analysis with Python. Packt Publishing Ltd, 2015.
eResources addresses	Adresy na platformie eNauczanie: Pozyskiwanie i wizualizacja geodanych - (WILiŚ, GiK, st. II, sem. 1) - rok 2022/2023 - Moodle ID: 29519 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=29519
Example issues/ example questions/ tasks being completed	1. 3D GIS - levels of detail and stages of 3D mapping.2. Definition, purpose and breakdown of metadata.3. Give methods of cartographic visualization for thematic maps.
Work placement	Not applicable