

Subject card

Subject name and code	Geoinformatics - laboratory exercises, PG_00131509						
Field of study	Marine Hydrography						
Date of commencement of studies	October 2025		Academic year of realisation of subject		2027/2028		
Education level	Bachelor's studies		Subject group		Obligatory subject group in the field of study Subject group related to practical vocational preparation		
Mode of study	full-time studies		Mode of delivery		at the university		
Year of study	3		Language of instruction		Polish		
Semester of study	5		ECTS credits		2.0		
Learning profile	practical		Assessment form		credit		
Conducting unit							
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. inż. Krzysztof Naus				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	0.0	0.0	25.0	0.0	0.0	25
	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	25		2.0		16.0	43
Subject objectives	1. Presentation of the functionality of programming environments for acquiring, processing, and presenting spatial data. 2. Discussion on the principles of designing and creating spatial databases. 3. Introduction to the principles of spatial data conversion, transforming planar coordinates to ellipsoidal coordinates. 4. Discussion on the functioning of data transmission from hydrographic devices and satellite navigation devices. 5. Introduction to operations on binary files and text strings from sensors.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[HML3-U14] use the applicable terminology in presenting and discussing problems related to the field of study		Is capable of: - Using the current terminology to present and discuss problems related to the field of study.		[SU2] presentation/project/paper/report		
	[HML3-W05] map construction and its symbolism		Knows: - The structure of maps and their symbolism.		[SW2] presentation/project/paper/report		
	[HML3-U04] use analytical, simulation and experimental methods to identify, formulate and solve engineering tasks		Is capable of: - Utilizing analytical, simulation, and experimental methods to identify, formulate, and solve engineering tasks.		[SU2] presentation/project/paper/report		
Subject contents	Programmatic methods for acquiring spatial data. Spatial data conversion. Programmatic methods for spatial data analysis. Designing and creating spatial databases. Registration of analog map raster, converting planar coordinates to ellipsoidal coordinates. Digital data transmission from hydrographic and navigation devices. Introduction to the Embarcadero Tokyo 10.2 environment. Input and output operations on files containing data from sensors in text and binary formats. Developing software for controlling and acquiring spatial data from navigation sensors. Building software for generating point, line, and area geometric objects. Creating monolithic database architectures. Creating client-server database architectures, exchanging XML documents oriented towards data.						

Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Project	51.0%	100.0%
Recommended reading	Basic literature	1. Bielecka, E.: "Geographic Information Systems. Theory and Applications." PJWSTK, Warsaw, 2006. 2. Myrda, G.: "Geographic Information Systems. Spatial Data Management in GIS, SIP, SIT, LIS." Helion Publishing, Gliwice, 2005. 3. Werner, P.: "Introduction to Geographic Information Systems." Jark Publishing, Warsaw, 2004.	
	Supplementary literature	1. Grębosz, J.: "Symfonia C++ Standard. Object-Oriented Programming in C++. Volumes I and II." Edition Publishing, 2015.	
	eResources addresses		
Example issues/ example questions/ tasks being completed	1. Example of implementing a grid generation on a given area. 2. How to implement reading a binary file with data from a hydrographic sensor? 3. Example of implementing real-time GPS data reception in Python. 4. Example of implementing a script to fetch data from a WMS service. 5. What libraries and tools are available in Python for acquiring spatial data?		
Work placement	Not applicable		

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