

Subject card

Subject name and code	Geoinformatics - lecture, PG_00131507						
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		
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		1.0		
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	15.0	0.0	0.0	0.0	0.0	15
	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	15		1.0		13.0	29
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-U07] effectively use information and communication techniques, including utility programs to solve professional problems		Is capable of: - Perform a preliminary economic assessment of proposed solutions and engineering actions.		[SU4] test/exam - oral or written		
	[HML3-W04] the issue of measurements related to the exploration of sea basins and inland waters and tools allowing to describe, interpret and present the results of measurements		Knows: - The issues related to measurements in the study of marine and inland water bodies, as well as the tools for describing, interpreting, and presenting measurement results.		[SW4] test/exam - oral or written		
	[HML3-W05] map construction and its symbolism		Knows: - The structure of maps and their symbolism.		[SW4] test/exam - oral or written		
	[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.		[SU4] test/exam - oral or written		

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 both text and binary formats. Developing software for controlling and acquiring spatial data from navigation sensors. Building software that allows for the generation of point, line, and area geometric objects. Creating monolithic database architectures. Creating client-server database architectures and exchanging XML documents oriented towards data.		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Colloquium	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.: "Symphony C++ Standard. Object-Oriented Programming in C++. Volumes I and II." Edition Publishing, 2015.	
	eResources addresses		
Example issues/ example questions/ tasks being completed	1. What are the basic steps for converting data from Shapefile to GeoJSON? 2. How to convert planar coordinates (UTM) to ellipsoidal coordinates (latitude and longitude)? 3. What are the steps for creating a PostGIS database from scratch? 4. What are the differences between monolithic and client-server databases in the context of spatial data? 5. How to create the first project in Embarcadero Tokyo 10.2? 6. How to create an application that generates geometric objects in Python using the Shapely library?		
Work placement	Not applicable		

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