University of Gdańsk

Subject card

Subject name and code	Geoinformatics - laboratory classes , PG_00200501		
Field of study	Marine Hydrography		
Date of commencement of studies	October 2026	Academic year of realisation of subject	2028/2029
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	18.0	45

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-U04] is able to use analytical, simulation and experimental methods to identify, formulate and solve engineering tasks	is able to use analytical, simulation, and experimental methods to identify, formulate, and solve engineering problems	[SU2] presentation/project/paper/ report
[HML3-U14] is able to use the applicable terminology in presenting and discussing problems related to the field of study	is able to use the relevant terminology when presenting and discussing issues related to their field of study	[SU2] presentation/project/paper/ report
[HML3-W05] knows and understands, at an advanced level, map construction and its symbolism	knows the structure of a map and its symbols	[SW2] 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.

<table>
<tr><td>Prerequisites and co-requisites</td><td colspan="3"></td></tr>
<tr><td>Assessment methods and criteria</td><td colspan="3"><table><tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr><tr><td>Project</td><td>51.0%</td><td>100.0%</td></tr></table></td></tr>
<tr><td rowspan="3">Recommended reading</td><td>Basic literature</td><td colspan="2">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.</td></tr>
<tr><td>Supplementary literature</td><td colspan="2">1. Gręboszj, J.: "Symfonia C++ Standard. Object-Oriented Programming in C++. Volumes I and II." Edition Publishing, 2015.</td></tr>
<tr><td>eResources addresses</td><td colspan="2"></td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td colspan="3">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?</td></tr>
<tr><td>Work placement</td><td colspan="3">Not applicable</td></tr>
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