University of Gdańsk

Subject card

Subject name and code	Applied geoinformatics, PG_00131545						
Field of study	Marine Hydrography						
Date of commencement of studies	October 2024		Academic year of realisation of subject		2027/2028		
Education level	Bachelor's studies		Subject group		Optional subject group Subject group related to practical vocational preparation		
Mode of study	full-time studies		Mode of delivery		at the university		
Year of study	4		Language of instruction		Polish		
Semester of study	7		ECTS credits		3.0		
Learning profile	practical		Assessment form		credit		
Conducting unit							
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Piotr Bekier				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	0.0	0.0	45.0	0.0	0.0	45
	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	45		2.0		30.0	77
Subject objectives	1. Providing knowledge on the analysis of features of processed spatial data and the principles of choosing the appropriate data model, determining relationships between data: logical and spatial (topological model), and methods of acquisition. 2. Familiarization with methods of creating spatial databases. Structure of spatial data infrastructure. 3. Familiarization with software methods for using web portals based on http servers for the acquisition and management of geospatial information.						

Learning outcomes

Course outcome	Subject outcome	Method of verification
[HML3-U04] use analytical, simulation and experimental methods to identify, formulate and solve engineering tasks	is able to: - Use the appropriate scientific terminology when presenting and discussing problems related to the field of study.	[SU2] presentation/project/paper/ report
[HML3-U14] use the applicable terminology in presenting and discussing problems related to the field of study	is able to: - Use the appropriate terminology when presenting and discussing problems related to the field of study.	[SU2] presentation/project/paper/ report
[HML3-U12] use engineering standards and norms and apply technologies specific to the field of study	is able to: - Effectively use information and communication technologies, including commercial application software, to solve professional problems.	[SU6] demonstration of practical skills
[HML3-U06] make a preliminary economic assessment of the proposed solutions and engineering activities undertaken	is able to: - Perform preliminary economic assessments of proposed solutions and undertaken engineering actions.	[SU2] presentation/project/paper/ report
[HML3-U10] design - in accordance with the given specification - and make a simple device, object, system or implement a process typical for the field of study, using appropriately selected methods, techniques, tools and materials	is able to: - Design, according to a given specification, and construct a simple device, object, system, or carry out a process typical for the field of study, using appropriately selected methods, techniques, tools, and materials.	[SU6] demonstration of practical skills
[HML3-U05] when identifying, formulating and solving engineering tasks, integrate knowledge from various fields and disciplines and perceive their systemic and non-technical aspects, including ethical aspects	is able to: - When identifying, formulating, and solving engineering tasks, integrate knowledge from various fields and disciplines, and recognize their systemic and non-technical aspects, including ethical aspects.	[SU2] presentation/project/paper/ report
[HML3-U07] effectively use information and communication techniques, including utility programs to solve professional problems	is able to: - Effectively use information and communication technologies, including application software, to solve professional problems.	[SU6] demonstration of practical skills
[HML3-W16] engineering standards and norms specific to the field of study, in particular those recommended by IHO and IMO	knows: - Engineering standards and norms appropriate for the field of study, particularly those recommended by IHO and IMO.	[SW2] presentation/project/paper/ report
[HML3-W12] basic processes taking place in the life cycle of devices, facilities and technical systems	knows: - The basic processes occurring in the life cycle of devices, objects, and technical systems.	[SW2] presentation/project/paper/ report

Subject contents

Exercises: Registration of a raster from an analog map, conversion of planar coordinates to ellipsoidal coordinates. Input/output operations on files (binary and text), text string processing. Formats for spatial data recording, conversion of spatial data to different formats.

Laboratories: Design and development of an application for reading from a file and converting bathymetric measurement data recorded in the NMEA 0183/2000 standard into a tabular format. Creating an application for cartographic visualization using ArcGIS Runtime SDK technology. Developing an application for building a digital terrain model using a selected interpolation method. Developing a database application that provides data via REST and WMS/WFS services.

Prerequisites and co-requisites

1. Knowledge of the basics of geodesy and cartography.
2. Knowledge of the basics of computer science.
3. Knowledge of the basics of navigation and hydrography.

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
report/project	51.0%	100.0%

Recommended reading	Basic literature	1. GRAVES M.: Designing XML Databases. Professional's Handbook. Helion, 2002. 2. HOLZNER S.: XML. Professional's Handbook. Helion, 2001. 3. KRAAK M-J., ORMELING F.: Cartography. Visualization of Spatial Data. PWN, Warsaw 1998. 4. RÓŻYCKI J.: Mathematical Cartography. 1970. 5. SALISZCZEW K. A.: General Cartography. PWN, Warsaw 1998. 6. URBAŃSKI J.: Mathematical Foundations of Map Projections. 1981. 7. WERESZCZYŃSKI J.: Navigational Cartography. 1970.
	Supplementary literature	1. IEC Publication 61174. 1998. 2. IHO Special Publiction No. 52. 1996. 3. IHO Special Publication No. 57. 1996. 4. IMO Resolution A 817 (19). 1995. 5. ISO/TC211 Standardy serii 19100. 1998.
	eResources addresses	
Example issues/ example questions/ tasks being completed	1. What are the differences between spatial databases and traditional databases? 2. What technologies are used in WebGIS? 3. Develop a spatial data model. 4. Create a simple WebGIS application. 5. Import GIS data into a WebGIS platform.	
Work placement	Not applicable	

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