University of Gdańsk

Subject card

Subject name and code	Applied Geoinformatics - laboratory classes , PG_00201164		
Field of study	Marine Hydrography		
Date of commencement of studies	October 2026	Academic year of realisation of subject	2029/2030
Education level	Bachelor's studies	Subject group	Obligatory subject group in the field of study 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	3.0	27.0	75

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] is able to 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-U07] is able to effectively use information and communication techniques, including utility programs to solve professional problems	is able to effectively use information and communication technologies, including software applications, to solve professional problems	[SU6] demonstration of practical skills
	[HML3-U05] when identifying, formulating and solving engineering tasks, is able to integrate knowledge from various fields and disciplines and perceive their systemic and non-technical aspects, including ethical aspects	is able to integrate knowledge from various fields and disciplines when identifying, formulating, and solving engineering problems, and to recognize their systemic and non-technical aspects, including ethical considerations	[SU2] presentation/project/paper/ report
	[HML3-U10] is able to 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-U12] is able to 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-U14] is able to 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-U06] is able to 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-W12] knows and understands, at an advanced level, the key processes occurring in the life cycle of devices, facilities, and technical systems	knows at an advanced level the processes involved in the life cycle of technical devices, facilities, and systems	[SW2] presentation/project/paper/ report
	[HML3-W16] knows and understands 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

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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