University of Gdańsk

Subject card

Subject name and code	GIS - lecture, PG_00198853		
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
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	20.0	0.0	0.0	0.0	0.0	20

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	20	1.0	9.0	30

Subject objectives

Conveying knowledge in the following areas:

- familiarization with the capabilities and practical applications of GIS.
- understanding the principles of cartographic image composition.
- acquiring theoretical and practical knowledge in the design and use of GIS.
- learning selected methods of graphic analysis.
- gaining skills in performing geographic data analyses using GIS.
- presentation of results, map composition, and printing.
- acquiring the ability to use GIS software ArcGIS/ArcGIS Pro or QGIS at a basic to intermediate level.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[HML3-W16] knows and understands engineering standards and norms specific to the field of study, in particular those recommended by IHO and IMO	knows the engineering standards and norms relevant to their field of study, particularly those recommended by the IHO and the IMO	[SW4] test/exam - oral or written
[HML3-W06] knows and understands, at an advanced level, principles of operation and use of navigation devices and systems and issues related to the determination of the position of the object using all available methods	knows the principles of operation and use of navigation equipment and systems, as well as issues related to determining the position of an object using all available methods	[SW4] test/exam - oral or written
[HML3-W05] knows and understands, at an advanced level, map construction and its symbolism	knows the structure of a map and its symbols	[SW4] test/exam - oral or written

<table>
<tr><td>Subject contents</td><td>Lecture topics:

1. The components of a GIS system, an overview of software, a discussion on the history of GIS development and implementation, and the basic advantages and benefits.
2. Data formats in GIS, including raster and grid data, vector data and their attributes, and types of data.
3. Cartographic projections and major sources of publicly available GIS data.
4. Creating spatial data, including acquisition and sources of data for GIS, and principles of data entry.
5. Vector data, including accuracy, topology of vector drawings, geometry and errors, and processing vector data such as interpolation.
6. Operations on vector data, including database functions, data joining, and utilizing spatial relationships between objects.
7. Raster data, including types and usage, classification, and grid data with a discussion of utilization possibilities and examples of applications.
8. Presentation of digital data, including analysis, modeling, and visualization.
9. Electronic navigational charts.
10. The use of GIS in navigation and hydrography.</td></tr>
<tr><td>Prerequisites and co-requisites</td><td></td></tr>
<tr><td>Assessment methods and criteria</td><td><table><tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr><tr><td>Colloquium</td><td>51.0%</td><td>100.0%</td></tr></table></td></tr>
<tr><td>Recommended reading</td><td><table><tr><td>Basic literature</td><td>1. Bielecka, E.: "Geographic Information Systems. Theory and Applications." PJWSTK Publishing, Warsaw, 2006.
2. Kraak, M. J., Ormeling, F.: "Cartography: Visualization of Spatial Data." PWN, Warsaw, 1998.
3. Litwin, L., Myrda, G.: "Geographic Information Systems. Spatial Data Management in GIS, SIP, SIT, LIS." Helion, Gliwice, 2005.
4. Longley, P. A., Goodchild, M. F., Maguire, D. J., Rhind, D. W.: "GIS. Theory and Practice." PWN, Warsaw, 2006.
5. Davis, D.: "GIS for Everyone." Mikom Publishing, Warsaw, 2004.
6. Urbański, J.: "Understanding GIS. Spatial Information Analysis." PWN, Warsaw, 1997.</td></tr><tr><td>Supplementary literature</td><td>1. GOODCHILD M. F., LONGLEY P. A.: Geospatial Analysis - a comprehensive guide. 2nd edition, 2006-2008.
2. IHO Special Publiction No. 52, 1996.
3. IHO Special Publication No. 57, 1996.
4. ISO/TC211 Standardy serii 19100, 1998.</td></tr><tr><td>eResources addresses</td><td></td></tr></table></td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td>1. What are the main components of a GIS system?
2. Explain the differences between vector and raster data.
3. What are the most important principles for entering data into a GIS system?
4. What is topology in the context of vector data?
5. How are spatial analyses conducted in GIS?
6. How is GIS used in hydrography?
7. What database functions are available in GIS?
8. What are grid data and what are their main applications?</td></tr>
<tr><td>Work placement</td><td>Not applicable</td></tr>
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