University of Gdańsk

Subject card

Subject name and code	GIS I - laboratory classes, PG_00216186		
Field of study	Marine Hydrography		
Date of commencement of studies	October 2027	Academic year of realisation of subject	2029/2030
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 Maciej Markowski	
	Teachers		

Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	0.0	0.0	30.0	0.0	0.0	30
	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	30	2.0	18.0	50

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.
- Presenting results, composing maps, and creating prints.
- 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-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	when identifying, formulating, and solving engineering problems, is able to integrate knowledge from various fields and disciplines and recognize their systemic and non-technical aspects, including ethical considerations	[SU2] presentation/project/paper/ report [SU4] test/exam - oral or written
[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 [SU4] test/exam - oral or written
[HML3-U12] is able to use engineering standards and norms and apply technologies specific to the field of study	is able to apply engineering standards and norms and use technologies relevant to their field of study	[SU2] presentation/project/paper/ report [SU4] test/exam - oral or written
[HML3-K03] is ready to apply economic and legal conditions in the aspect of professional activity related to the field of study	is ready to apply legal provisions and market principles when using spatial databases	[SK8] observation of student's independent or team work
[HML3-U11] is able to use navigation devices, means of technical observation and communication as well as measuring instruments, as well as apply in practice various techniques of measurement and observation in the field of professional activity related to the field of study	is able to use navigation equipment, technical surveillance and communication devices, and measuring instruments, as well as apply various measurement and observation techniques in practice within the scope of professional activities related to their field of study	[SU2] presentation/project/paper/ report

Subject contents

Exercise Topics:

1. Understanding basic concepts in GIS and becoming familiar with the most commonly used GIS software.
2. Familiarizing with the concept of metadata and acquiring skills in obtaining, processing, and creating metadata for spatial data.
3. Creating map compositions according to cartographic principles.
4. Georeferencing and georectifying raster and vector sources and using them to acquire spatial data.
5. Acquiring and processing vector data.
6. Importing and processing data in various formats (e.g., CSV, XLS, DBF, SQLite, Shapefile, FGDB).
7. Exporting and exchanging vector and raster data in commonly used formats.
8. Performing spatial analyses (vector, raster) and presenting the obtained results through map compositions using methods such as choropleth maps, cartograms, 3D models, interpolation etc.
9. Creating file-based databases as an element of designing GIS systems.

Prerequisites and co-requisites

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Test	51.0%	40.0%
Projects	51.0%	60.0%

Recommended reading

Basic literature	1. Bielecka, E.: "Systemy informacji geograficznej. Teoria i zastosowania." Wyd. PJWSTK, Warsaw, 2006. 2. Kraak, M. J., Ormeling, F.: "Kartografia: wizualizacja danych przestrzennych." PWN, Warsaw, 1998. 3. Litwin, L., Myrda, G.: "Systemy informacji geograficznej. Zarządzanie danymi przestrzennymi w GIS, SIP, SIT, LIS." Helion, Gliwice, 2005. 4. Longley, P. A., Goodchild, M. F., Maguire, D. J., Rhind, D. W.: "GIS. Teoria i praktyka." PWN, Warsaw, 2006. 5. Davis, D.: "GIS dla każdego." Wydawnictwo Mikom, Warsaw, 2004. 6. Urbański, J.: "Zrozumieć GIS. Analiza informacji przestrzennej." PWN, Warsaw, 1997.
Supplementary literature	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.
eResources addresses	

Example issues/ example questions/ tasks being completed

1. What are the steps for importing data from a CSV file into GIS?
2. How to perform a buffering analysis in GIS?
3. What are the steps for creating a 3D terrain model?
4. What are the steps for creating an SQLite database in GIS
5. Example of creating a thematic map in GIS.
6. What are the steps in the georeferencing process for a raster image?

Work placement

Not applicable

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