University of Gdańsk

Subject card

Subject name and code	GIS - laboratory exercises, PG_00131519		
Field of study	Marine Hydrography		
Date of commencement of studies	October 2024	Academic year of realisation of subject	2026/2027
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	3.0
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	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

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, integrate knowledge from various fields and disciplines and perceive their systemic and non-technical aspects, including ethical aspects	Is capable of: - Integrating knowledge from various fields and disciplines when identifying, formulating, and solving engineering tasks, recognizing their systemic and non-technical aspects, including ethical considerations.	[SU2] presentation/project/paper/ report
[HML3-U04] use analytical, simulation and experimental methods to identify, formulate and solve engineering tasks	Is capable of: - Utilizing analytical, simulation, and experimental methods to identify, formulate, and solve engineering tasks.	[SU2] presentation/project/paper/ report
[HML3-K03] apply economic and legal conditions in the aspect of professional activity related to the field of study	Is capable of: - Working independently or as part of a team, taking responsibility for their own work and for tasks carried out jointly.	[SK8] observation of student's independent or team work
[HML3-U12] use engineering standards and norms and apply technologies specific to the field of study	Is capable of: - Utilizing engineering standards and norms, and applying technologies relevant to the field of study.	[SU2] presentation/project/paper/ report
[HML3-U11] 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 capable of: - Using navigation devices, technical observation and communication means, and measuring instruments, as well as practically applying various measurement and observation techniques in professional activities related to the 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, 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
Project	51.0%	100.0%

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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