Subject card

Subject name and code	Maps and GIS - laboratory, PG_00206164						
Field of study	Oceanography						
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 Optional subject group			
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	academic		Assessment form	credit			
Conducting unit	Geographic Information System (GIS) Laboratory -> Faculty of Oceanography and Geography -> Rector						
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	40.0	0.0	0.0	40
	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	40		3.0	32.0	75	
Subject objectives	Familiarization with the components of GIS as a computer system and its tasks (using ArcGIS Pro as example). Learning the basic concepts of geoinformation technology, the specifics of spatial data, and methods for modeling and visualizing them. Acquiring theoretical foundations and skills for describing the location of data on the Earth's surface. Understanding methods for acquiring primary and secondary data for GIS and their preliminary processing. Getting acquainted with basic vector and raster functions. Learning the principles and methods for presenting work results in the form of maps.						

Learning outcomes

Course outcome	Subject outcome	Method of verification
[OCEANL3-K03] is ready to exercise caution and criticism in accepting information from scientific literature, the Internet and other media relating to natural sciences	The student is prepared to exercise caution when accepting information from the Internet and other media and to assess the quality of obtained data related to the natural sciences. Contents: B. 4-B.7.	[SK2] presentation/project/paper/ report
[OCEANL3-U04] is able to independently search for information in Polish and foreign specialist literature, as well as on the Internet and in databases	The student is capable of independently searching for source information, including archival and electronic spatial databases, as well as Polish and foreign map services, in the field of oceanographic issues. They critically analyze and synthesize the information and data obtained. Contents: B.1-B.11.	[SU2] presentation/project/paper/ report [SU4] test/exam - oral or written
[OCEANL3-W05] has an advanced knowledge of techniques, research methods, and tools (mathematical, statistical, and computational) used by oceanographers to describe and interpret processes and phenomena occurring in the marine environment	The student has advanced knowledge of the significance of basic geoinformatics techniques and tools used by oceanographers to describe and interpret phenomena and processes occurring in the aquatic environment. Contents: B.1-B.11.	[SW4] test/exam - oral or written [SW2] presentation/project/paper/ report
[OCEANL3-U05] is able to use general-purpose and specialized software, as well as mathematical and statistical methods, in data analysis and the presentation of results	The student is capable of using specialized computer software (ArcGIS Pro) and methods for analyzing spatial data related to the marine environment and presenting the results of these analyses in the form of maps. Contents: B.1-B.11.	[SU2] presentation/project/paper/ report [SU4] test/exam - oral or written

Subject contents

B.1 The concept of geotechnology and spatial data. Coordinate systems. Projections.B.2 Familiarization with the ArcGIS Pro interface, exploration of spatial data. Metadata.B.3 Spatial data models. Digital maps. Data symbolization.B.4 Utilization of various data sets. Exploration and analysis of attribute data.B.5 Working with point data obtained from various sources (spatial and non-spatial).B.6 Registration of spatial data in a coordinate system. The concept of georeferencing and rectification.B.7 Data input and editing. On-screen digitization.B.8 Overview of basic vector analysis functions. Vector modeling.B.9 Overview of basic raster analysis functions. Raster modeling.B.10 Digital terrain model: determining slope and its direction, creating contour lines.B.11 Understanding principles and methods of presenting work results in the form of maps. Creating maps at different scales and using various projections.

Prerequisites and co-requisites

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Test	51.0%	40.0%
Practical and theoretical exercises	51.0%	60.0%

Recommended reading

Basic literature

- Urbański J., 2008. GIS w badaniach przyrodniczych, Wyd. Uniwersytetu Gdańskiego, Gdańsk.- Longley P.A., Goodchild M.F., Rhind D.W., 2008. GIS. Teoria i praktyka, Wyd. Naukowe PWN, Warszawa.- Jażdżewska I., Lechowski Ł., 2018, Wstęp do geoinformacji z ArcGIS, Wyd. Uniwersytety Łódzkiego.

	Supplementary literature	- Gic-Grusza, G, Kryla-Staszewska, L., Urbański, J., Warzocha, J., Węsławski, JM (eds.). 2009. Atlas siedlisk dna polskich obszarów morskich.- Zwoliński Z.(red.) , 2010, GIS woda w środowisku, Bogucki Wydawnictwo Naukowe.- Urbański J.,Wochna A.,2012, Wykorzystanie danych obrazowych w GIS do analizy wód powierzchniowych [w] Zwoliński Z.(red.) GIS : teledetekcja środowiska, Bogucki Wydawnictwo Naukowe.- Law M., Collins A., 2016, Getting to Know ArcGIS Pro, ESRI Press.- Bakiewicz-Grabowska E., Markowski M., Lemańczyk K., 2016, Application of geoinformation techniques to determine zones of sediment resuspension induced by wind waves in lakes (using two lakes from Northern Poland as examples), Limnological Review 16(1): 3-14.
	eResources addresses	
Example issues/ example questions/ tasks being completed		
Work placement	Not applicable	

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