

Subject card

Subject name and code	Maps and GIS - laboratory exercises, PG_00157810						
Field of study	Oceanography						
Date of commencement of studies	October 2025		Academic year of realisation of subject		2026/2027		
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	2		Language of instruction		Polish		
Semester of study	4		ECTS credits		2.0		
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		5.0		15.0	60
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-U05	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
	OCEANL3-W05	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-U04	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-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
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
	practical and theoretical exercises	51.0%	60.0%
	test	51.0%	40.0%
Recommended reading	Basic literature	- Gic-Grusza, G, Kryla-Staszewska, L., Urbański, J., Warzocha, J., Węśławski, 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.	
	Supplementary literature	- 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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