University of Gdańsk

Subject card

Subject name and code	GIS in geology - laboratory classes, PG_00193074		
Field of study	Geology		
Date of commencement of studies	October 2026	Academic year of realisation of subject	2027/2028
Education level	Bachelor's studies	Subject group	Obligatory subject group in the field of study Subject group related to scientific research 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	3	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	25.0	0.0	0.0	25

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	25	2.0	23.0	50

Subject objectives

Familiarization with the elements and tasks of GIS as a computer system (using ArcGIS Pro). Understanding the basic concepts of geoinformation technology, the specifics of spatial data, and methods of their modeling and visualization. Acquiring theoretical foundations and skills for describing the location of data on the Earth's surface. Familiarization with existing digital spatial data for Poland. Learning methods for data acquisition and initial processing. Introduction to basic vector and raster functions. Understanding principles and methods of presenting work results in the form of maps.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[GEOLL3_W06] knows statistical and IT tools as well as the principles of preparing engineering and geological documentation and cartographic materials	The student is familiar with IT tools for creating and analyzing spatial data as well as the principles of preparing cartographic materials. B1.-B8.	[SW4] test/exam - oral or written [SW2] presentation/project/paper/ report
[GEOLL3_U04] is able to use specialized computer software and mathematical and statistical methods in the analysis of geological data	The student is capable of using specialized computer software (ArcGIS Pro) and methods for analyzing geological spatial data, as well as presenting the analysis results in the form of maps. B1.-B8.	[SU2] presentation/project/paper/ report [SU4] test/exam - oral or written
[GEOLL3_K03] is willing to exercise caution and criticism in receiving information from scientific literature, the Internet and other media related to natural sciences	The student is prepared to exercise caution when accepting information from the Internet and other media and to evaluate the quality of the acquired data related to natural sciences. B1.-B8.	[SK2] presentation/project/paper/ report
[GEOLL3_U03] is able to use source information in Polish and English, including archival and electronic databases, in the field of geological issues	The student can utilize source information, including archival and electronic spatial databases, as well as Polish and international map services, in the field of geological issues. B1.-B8.	[SU2] presentation/project/paper/ report [SU4] test/exam - oral or written

Subject contents	B1. Understanding geotechnology and spatial data. Coordinate systems. Map projections. B2. Familiarization with the ArcGIS Pro interface, exploring spatial data. B3. Spatial data models. Digital maps. Basic principles of data symbolization. B4. Utilizing various datasets in geographic projects (MPHP, Corine, VMap, SRTM, NMT CODGIK). Exploring and analyzing attribute data. B5. Working with point data acquired from different non spatial sources. B6. Registering spatial data in coordinate systems. Understanding georeferencing and rectification. Determining registration error. B7. Overview of basic functions (tools) of vector and raster analysis. B8. Understanding principles and methods of presenting work results in the form of maps. Creating maps in 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	Markowski M., Golus W., Kwidzińska M., 2015, Aplikacyjność metod oceny wielkości opadów zasilających oczka Pomorza Gdańskiego [w:] D. Absalon, M. Matysik, M. Ruman [red.] Nowoczesne metody i rozwiązania w hydrologii i gospodarce wodnej, Komisja Hydrologiczna Polskiego Towarzystwa Geograficznego, Sosnowiec, s. 287-298. Bajkiewicz-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 1/2016.Law M., Collins A., 2016, Getting to Know ArcGIS Pro, ESRI Press.
	eResources addresses	
Example issues/ example questions/ tasks being completed	Searching for geospatial data and creating metadata. Creating spatial data from non-spatial tabular data. Creating map compositions in accordance with cartographic principles.	
Work placement	Not applicable	

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