University of Gdańsk

Subject card

Subject name and code	GIS - design laboratory (Laboratory classes), PG_00201213						
Field of study	Physical geography and geoinformation						
Date of commencement of studies	October 2026		Academic year of realisation of subject		2027/2028		
Education level	Master'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	3		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	60.0	0.0	0.0	60
	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	60		8.0		7.0	75
Subject objectives	1. Acquisition of skills by course participants in using and integrating GIS and ETL tools with advanced statistical and spatial analysis capabilities. 2. Improvement of skills in presenting and analyzing data for creating thematic layers related to natural, economic, and social phenomena, as well as spatiotemporal information. 3. Integration of knowledge and skills for project implementation in the fields of meteorology and climatology, hydrology, limnology, or geomorphology.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[GFGMU2_K03] is ready to accepting responsibility for group work assuming various roles in it, participating in preparation of scientific projects, taking responsibility for the equipment and safety rules, active developing of professional competences and knowledge in Earth and environmental sciences and geoinformation, including interdisciplinarity, as well as developing the principles of professional ethics, respecting copyright rules	The student is prepared to work in a team, capable of taking on different roles in scientific projects, actively develops professional competencies in geoinformatics, ensures safety when handling assigned equipment, and applies professional ethics, including copyright regulations, in their own work and in evaluating the work of others.Contents: 1-5.	[SK2] presentation/project/paper/ report
	[GFGMU2_K01] is ready to critically assess the knowledge obtained in the field of Earth and environmental sciences, particularly physical geography and geoinformation, its completion and verification through further critical analysis of scientific literature	The student is ready to critically assess his knowledge in the field of geoinformation, to supplement and verify it by critically engaging with the relevant literature. Contents: 1-5.	[SK2] presentation/project/paper/ report
	[GFGMU2_U02] is able to precisely and appropriately use terminology in the field of physical geography and geoinformation in oral statements and written works	The student demonstrates fluency in using physical geography and geoinformatics terminology in written reports and presentations, applying it appropriately in the context of spatial data analysis and interpretation. Contents: 1-5.	[SU2] presentation/project/paper/ report
	[GFGMU2_U04] is able to describe and analyze the causes and course of physical and geographical processes and phenomena, selecting and applying advanced techniques and research tools in the field of statistical and geoinformation methods, interpreting the results, using theoretical knowledge to formulate own opinions and conclusions	The student is able to use geoinformatics tools and statistical methods to investigate and interpret physical-geographical processes and phenomena, analysing their course and interrelationships. Based on processed data, formulates independent conclusions and assessments, integrating practical analysis results with theoretical knowledge. Contents: 1-5.	[SU2] presentation/project/paper/ report
	[GFGMU2_W04] knows and understands theoretical foundations of research methods used in physical geography and closely related sciences, descriptive and mathematical statistics, as well as in a deepened extent methods of analyzing spatial phenomena	The student has knowledge of and understands the theoretical foundations of research methods used in physical geography and related disciplines, including statistical methods, and is able to apply advanced techniques to analyze spatial phenomena using geoinformatics tools.Contents: 2-5.	[SW2] presentation/project/paper/ report
	[GFGMU2_W03] knows and understands in a deepened extent issues in the theory of geographic information systems, basics of organization and operation of spatial information infrastructures and possibilities of using geoinformatics tools in physical geography	The student has knowledge of the fundamentals of geographic information systems theory, understands the organization and functioning of spatial information infrastructures, and is able to practically use geoinformatics tools for the analysis and visualization of data in physical geography. Contents: 2-5.	[SW2] presentation/project/paper/ report
	[GFGMU2_W05] knows and understands principles of planning field and laboratory research using techniques and research tools used in geomorphology, hydrology and climatology, as well as principles of operating equipment and devices used to obtain and process digital geographic information in accordance with health and safety principles	Is familiar with the principles of planning and conducting research and is able to operate equipment and devices for acquiring and processing digital geographic data, while adhering to safety regulations.Contents: 2-5.	[SW2] presentation/project/paper/ report

Subject contents	1. Selection and conceptual preparation of project work. 2. Data gathering, processing, and integration for project needs using GIS and/or ETL tools and/or scripting languages. 3. Preparation and execution of spatial analyses using vector and raster models. 4. Presentation of analysis results using advanced methods of visualization and result publication. 5. Interpretation of obtained results within the framework of the project being carried out.
Prerequisites and co-requisites	

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
practical exercises	51.0%	100.0%

Recommended reading

Basic literature	- Malczewski J., Jaroszewicz J., 2018, Podstawy analiz wielokryterialnych w systemach informacji geograficznej, Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa. - Medyńska-Gulij B., 2024, Kartografia - geomatycznie i geomedialnie, Wydawnictwo Naukowe PWN, Warszawa. - Zwoliński, Zb. (red.), 2009, GIS - platforma integracyjna geografii. Bogucki Wydawnictwo Naukowe, Poznań.Longley P.A., - Goodchild M.F., Maguire D.J., Rhind D.W., 2010, Geographic Information Systems and Science. Wiley.
Supplementary literature	- 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, 16: 3-14. - Ustrnul Z., Czekierda D., 2006, Metody Analizy Przestrzenno-Czasowej w Badaniach Klimatologicznych (Na Przykładzie Polski), Roczniki Geomatyki IV.2, 147160. - Szymanowski, M., Kryza M., 2012, The Application of Local Regression Residual Kriging for Spatial Interpolation of Annual Mean Air Temperature in Poland. Przegląd Geofizyczny, 57.1, 7384.
eResources addresses	

Example issues/ example questions/ tasks being completed	Creating a multi-criteria analysis model - suitability analysis. Creating a map atlas - map series.
Work placement	Not applicable

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