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 2027	Academic year of realisation of subject	2028/2029
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_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_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_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_W05] knows and understands to a deepened extent 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
	[GFGMU2_U04] is able, either independently or as part of a group, to formulate and test hypotheses regarding the causes and progression of physical-geographical processes and phenomena; selects and applies advanced research methods and tools, including statistical and geoinformatics methods, adapting them to the context where necessary; skilfully visualises the results of spatial data analysis, critically interprets the findings, and formulates conclusions and their own position based on these, which they justify in debate	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_K01] is able to behave appropriately in the workplace and in everyday life by critically evaluating information received in the light of their existing knowledge, recognising the importance of knowledge in solving cognitive and practical problems, and, when faced with difficulties, drawing on expert knowledge	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_K03] is prepared to fulfil professional responsibilities in both independent and team-based work by advancing the field of geography, upholding the profession’s ethos, adhering to and developing the principles of professional ethics, and ensuring compliance with these principles	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

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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