

Subject card

Subject name and code	Introduction to geoinformation science - practical, PG_00135484						
Field of study	Physical geography and geoinformation						
Date of commencement of studies	October 2025		Academic year of realisation of subject		2025/2026		
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	1		Language of instruction		Polish		
Semester of study	1		ECTS credits		4.0		
Learning profile	academic		Assessment form				
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	45.0	0.0	0.0	45
	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	45		15.0		60.0	120
Subject objectives	1. Introduction to the elements of GIS as a computer system and its tasks (using ArcGIS Pro as an example). 2. Learning the methods of acquiring primary and secondary data for GIS and their preliminary processing. 3. Familiarization with basic vector and raster functions in ArcGIS. 4. Gaining skills in GIS modeling using vector and raster analysis functions. 5. Understanding the principles and methods of presenting work results in the form of maps.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[GFGMU2_W03] advanced 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	Student understands advanced topics in geographic information systems theory, fundamentals of spatial information infrastructure organization and operation, as well as the capabilities of ArcGIS software. Contents: B.1-B.9	[SW4] test/exam - oral or written [SW2] presentation/project/paper/report
	[GFGMU2_U04] 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 capable of analyzing the causes and processes of physical-geographical phenomena by skillfully selecting and applying advanced techniques and research tools in the field of geoinformatics methods. Contents: B.1-B.9.	[SU2] presentation/project/paper/report [SU4] test/exam - oral or written
	[GFGMU2_W04] theoretical foundations of research methods used in physical geography and closely related sciences, descriptive and mathematical statistics, as well as advanced methods of analyzing spatial phenomena	Student is familiar with and understands advanced methods of analyzing spatial phenomena using GIS tools. Contents: B.1-B.9.	[SW4] test/exam - oral or written [SW2] presentation/project/paper/report
	[GFGMU2_K01] critical assessment of knowledge in the field of Earth and environmental sciences and geoinformation, its completion and verification through critical analysis of scientific literature	The student is prepared to critically assess, supplement, and verify knowledge and skills in geoinformatics through completion of coursework. Contents: B.1-B.9.	[SK2] presentation/project/paper/report [SK4] test/exam - oral or written
	[GFGMU2_W05] 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	Student understands the principles of operating equipment and devices used for acquiring and processing digital geographic information. Contents: B.1-B.9.	[SW4] test/exam - oral or written [SW2] presentation/project/paper/report
Subject contents	B1. Advanced symbolization techniques including labeling procedures. B2. Data processing in the context of modifying cartographic projections. B3. Concept and creation of geodatabases. B4. Remote sensing methods for environmental monitoring. B5. Using DEM and DSM to identify areas meeting selected input criteria - "case study." B6. Application of interpolation techniques for mapping based on point data. B7. 2D and 3D modeling of geospatial data. B8. Vector modeling using geospatial analysis tools. B9. Raster modeling using geospatial analysis tools.		
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	- Bielecka E., 2006, Systemy Informacji Geograficznej - teoria i zastosowanie, Wydawnictwo Polsko-Japońskiej Akademii Technik Komputerowych, Warszawa. - Urbański J., 2008, GIS w badaniach przyrodniczych, UG, Gdańsk. - Davis D., 2004, GIS dla każdego, Wydawnictwo Mikom, Warszawa. - Medyńska-Gulij B., 2024, Kartografia - geomatycznie i geomedialnie, PWN.	

	Supplementary literature	• Tomlinson R., Thinking about GIS, 2013, Esri Press. • Longley P.A., Goodchild M.F., Rhind D.W., 2008, GIS. Teoria i praktyka, PWN, Warszawa. • 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.
	eResources addresses	Adresy na platformie eNauczanie:
Example issues/ example questions/ tasks being completed	Creating Advanced Geodatabase Structures with Domains and Subtypes. Using Remote Sensing Techniques for Environmental Studies	
Work placement	Not applicable	

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