

Subject card

Subject name and code	Introduction to geoinformation science - lecture, PG_00135486						
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		2.0		
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	15.0	0.0	0.0	0.0	0.0	15
	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	15		15.0		30.0	60
Subject objectives	1. Understanding basic concepts of geoinformatics, characteristics of spatial data, and methods for their modeling and visualization. 2. Acquiring theoretical foundations and skills for describing data locations on the Earth's surface. 3. Familiarization with existing basic spatial digital data for Poland. 4. Understanding principles and methods for presenting work results in the form of maps.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[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	Student can analyze geospatial data related to physical-geographical phenomena and processes, using appropriate geoinformatic processing tools, and draw relevant conclusions based on them. Program Contents: A1-A12.	[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 understands advanced methods for analyzing spatial phenomena using GIS tools. Contents: A1-A12.	[SW4] 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: A1-A12.	[SW4] test/exam - oral or written
	[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	Student is ready for critical assessment, supplementation, and verification of knowledge and skills in geoinformatics through critical review of literature. Contents: A1-A12.	[SK4] test/exam - oral or written
	[GFGMU2_U02] precisely and appropriately use terminology in the field of physical geography and geoinformation in oral statements and written works	Student can proficiently and accurately apply terminology related to geoinformatics in written work. Contents: A1-A12.	[SU4] test/exam - oral or written
	[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 (GIS) theory, basics of organizing and operating spatial information infrastructures, and capabilities of ArcGIS software. Contents: A1-A12.	[SW4] test/exam - oral or written
Subject contents	1. Concept of spatial data, coordinate systems, and projections. 2. Basic concepts of geotechnology, spatial data models, digital maps, principles of data symbolization. 3. Types of data. Acquisition of primary data and their organization. GPS as a tool for acquiring location information. 4. Basic sets of spatial data - Poland. Metadata. Satellite imagery. 5. Spatial data engineering. Attribute data and methods for their processing and analysis. 6. Georeferencing and georectification. Methods for encoding spatial information in raster data. Georeferencing error. Transformation methods. 7. Methods for editing spatial data. Digitization techniques from raster backgrounds. 8. Overview of basic functions (tools) for vector analysis. 9. Introduction to vector modeling methods. 10. Overview of basic functions (tools) for raster analysis. 11. Methods for raster modeling. 12. Interpolation methods for point data and creation of statistical surfaces. 13. Basic concepts of remote sensing.		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	written test	51.0%	100.0%

Recommended reading	Basic literature	- Davis D., 2004, GIS dla każdego, Wydawnictwo Mikom, Warszawa. - Gotlib D., Iwaniak A., Olszewski R., 2007. GIS. Obszary zastosowań. PWN Warszawa. - Urbański J., 2012, GIS w badaniach przyrodniczych (ebook), Centrum GIS, Uniwersytet Gdański.
	Supplementary literature	- Kryza M., Szymanowski M., Wieczorek M., 2007, The Application of Selected Interpolation Methods for Modelling Extreme Air Temperature in South-Western Poland, Przegląd Geofizyczny, 52(1):61-82. - Lyon J.G., 2003, GIS for water resources and watershed management, CRC Press. - Tomlinson R., Thinking about GIS, 2013, Esri Press.- Zwoliński Z. (red.), 2010, GIS woda w środowisku. Bogucki Wydawnictwo Naukowe, Poznań. - 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	Outline the highlights of the history of GIS. Describe the components and explain how GPS works. Describe the topological vector model.	
Work placement	Not applicable	

Document generated electronically. Does not require a seal or signature.