University of Gdańsk

Subject card

Subject name and code	Introduction to geoinformation science (Lecture), PG_00196132		
Field of study	Physical geography and geoinformation		
Date of commencement of studies	October 2027	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	1	Language of instruction	Polish
Semester of study	1	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	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	1.0	34.0	50

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_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	Student understands advanced methods for analyzing spatial phenomena using GIS tools. Contents: A1-A13.	[SW4] test/exam - oral or written
[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	Understands the principles of planning field and laboratory research as well as the use of equipment and devices for the acquisition and processing of digital geographic data in accordance with health and safety regulations. Contents: A1-A13.	[SW4] test/exam - oral or written
[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	Student is ready to critically evaluate information and independently develop competencies in geoinformation using professional literature and expert knowledge. Contents: A1-A13.	[SK4] test/exam - oral or written
[GFGMU2_U02] is able to precisely and appropriately use terminology in the field of physical geography and geoinformation in oral statements and written works	Student demonstrates fluency in using geoinformatics terminology in written reports and documentation, applying it appropriately in the context of spatial data analysis and interpretation. Contents: A1-A13.	[SU4] test/exam - oral or written
[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	Student has knowledge of advanced topics in geographic information systems theory, understands the organization and functioning of spatial information infrastructures, and is able to practically use ArcGIS software for the analysis and visualization of geographic data. Contents: A1-A13.	[SW4] test/exam - oral or written
[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	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-A13.	[SU4] 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	
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.