University of Gdańsk

Subject card

Subject name and code	Introduction to geoinformation science (Laboratory classes), PG_00201199		
Field of study	Physical geography and geoinformation		
Date of commencement of studies	October 2026	Academic year of realisation of subject	2026/2027
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	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. 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_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	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
[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 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_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 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_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 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_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 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

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	
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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