University of Gdańsk

Subject card

Subject name and code	, PG_00120425		
Field of study	Geography		
Date of commencement of studies	October 2024	Academic year of realisation of subject	2024/2025
Education level	undergraduate studies	Subject group	Obligatory subject group in the field of study Subject group related to scientific research 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	2	ECTS credits	2.0
Learning profile	academic	Assessment form	
Conducting unit	Pracownia Systemów Informacji Geograficznej - GIS -> Faculty of Oceanography and Geography		
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	7.0	28.0	50

Subject objectives

- Familiarization with the capabilities and practical applications of GIS

- Understanding the principles of cartographic image composition and selected methods of graphic analysis

- Acquiring theoretical and practical knowledge in GIS design and usage, remote sensing of the geographic environment, and conducting remote sensing analyses using specialized software

- Ability to prepare analyses using GIS, present results, compose maps, and utilize analytical methods in processing aerial and satellite photographic images, and digital imagery

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[GEOGRL3-W08] at an advanced level methods and principles development of data on the natural and anthropogenic environment, and methods of their analysis and interpretation	The student possess advanced knowledge and understanding of methods and principles for developing data on natural and anthropogenic environments, as well as methods for their analysis and interpretation using GIS tools. Contents: A.1-A.8. Student also have advanced knowledge and understanding of methods and principles used in remote sensing for developing data on natural and anthropogenic environments, as well as research and measurement techniques used during visual and digital interpretation in the process of acquiring geographic and social data. Contents: A.9-A.13. Additionally, Student have specific knowledge regarding modern technical imaging tools of Earth's surface used in photogrammetry and remote sensing. Contents: A. 11-A.13. Student are proficient in supervised and unsupervised classification methods for recognizing object classes in aerial and satellite digital imagery. Contents: A.13.	[SW4] test/exam - oral or written
	[GEOGRL3-K05] independently undertake and initiate professional behavior, including maintaining the principles of professional ethics in oneself and others, and care for the achievements and traditions of the geography profession	When working independently, student is ready to apply the practical application of the knowledge that have acquired. Contents: A.1-A.13.	[SK4] test/exam - oral or written

Subject contents	A1 Components of GIS system, software overview, history of GIS development and implementation A2 Data formats in GIS A3 Cartographic projections and main sources of publicly available GIS data A4 Creation of spatial data A5 Vector data - correctness, topology of vector drawings, geometry A6 Operations on vector data A7 Raster data - types, applications A8 Presentation of digital data, analysis, modeling, and visualization A9 Preliminary information remote sensing and photogrammetry A10 Overview of software used for remote sensing analysis A11 Photogrammetry - division, aerial photography, execution of photogrammetric images A12 Remote sensing - data acquisition: - ranges of electromagnetic radiation - modern technical means of Earth surface imaging - satellite imaging systems A13 Remote sensing - data processing: - processing of analog and digital images - environmental change monitoring using remote sensing data
Prerequisites and co-requisites	
Assessment methods and criteria	

Subject passing criteria	Passing threshold	Percentage of the final grade
	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 - Sitek Z., 1997. Wprowadzenie do teledetekcji lotniczej i satelitarnej, Wydawnictwa AGH, Kraków. - Adamczyk J., Będkowski K, 2007. Metody cyfrowe w teledetekcji. Wydawnictwo SGGW. - Kurczyński Z., 2006. Lotnicze i satelitarne obrazowanie Ziemi, Oficyna wydawnicza Politechniki Warszawskiej, Warszawa. - 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.
	Supplementary literature	- Richards J.A., Jia X., 2006. Remote sensing digital image analysis. Springer. - Butowtt J., Kaczyński R., 2003, Fotogrametria, Wojskowa Akademia Techniczna, Warszawa. - 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. - 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 1/2016.
	eResources addresses	Podstawowe https://pro.arcgis.com/en/pro-app/get-started/pro-quickstart-tutorials.html - ArcGISPro tutorials Adresy na platformie eNauczanie:
Example issues/ example questions/ tasks being completed		
Work placement	Not applicable	

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