

Subject card

Subject name and code	GIS and Remote Sensing II - lecture, PG_00120424						
Field of study	Geography						
Date of commencement of studies	October 2024	Academic year of realisation of subject			2025/2026		
Education level	Bachelor's 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	2	Language of instruction			Polish		
Semester of study	3	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		7.0		28.0	50
Subject objectives	<ul style="list-style-type: none"> - 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 ima 						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	<p>[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</p>	<p>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.</p> <p>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.</p> <p>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.</p> <p>Student are proficient in supervised and unsupervised classification methods for recognizing object classes in aerial and satellite digital imagery. Contents: A.13.</p>	<p>[SW4] test/exam - oral or written</p>
	<p>[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</p>	<p>When working independently, student is ready to apply the practical application of the knowledge that have acquired. Contents: A.1-A.13.</p>	<p>[SK4] test/exam - oral or written</p>

Subject contents	<p>A1 Components of GIS system, software overview, history of GIS development and implementation</p> <p>A2 Data formats in GIS</p> <p>A3 Cartographic projections and main sources of publicly available GIS data</p> <p>A4 Creation of spatial data</p> <p>A5 Vector data - correctness, topology of vector drawings, geometry</p> <p>A6 Operations on vector data</p> <p>A7 Raster data - types, applications</p> <p>A8 Presentation of digital data, analysis, modeling, and visualization</p> <p>A9 Preliminary information remote sensing and photogrammetry</p> <p>A10 Overview of software used for remote sensing analysis</p> <p>A11 Photogrammetry - division, aerial photography, execution of photogrammetric images</p> <p>A12 Remote sensing - data acquisition: -ranges of electromagnetic radiation -modern technical means of Earth surface imaging -satellite imaging systems</p> <p>A13 Remote sensing - data processing: -processing of analog and digital images -environmental change monitoring using remote sensing data</p>		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	test	51.0%	100.0%
Recommended reading	<p>Basic literature</p> <ul style="list-style-type: none"> - 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. 		

	Supplementary literature	<ul style="list-style-type: none"> - 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	<p>Supplementary</p> <p>https://pro.arcgis.com/en/pro-app/get-started/pro-quickstart-tutorials.html - ArcGISPro tutorials</p>
Example issues/ example questions/ tasks being completed		
Work placement	Not applicable	

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