



Subject card

Subject name and code	Geographical information systems, PG_00061753						
Field of study	Geodesy and Cartography						
Date of commencement of studies	October 2023		Academic year of realisation of subject		2024/2025		
Education level	first-cycle 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		5.0		
Learning profile	general academic profile		Assessment form		assessment		
Conducting unit	Department of Geodesy -> Faculty of Civil and Environmental Engineering						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Adam Inglot				
	Teachers		dr inż. Adam Inglot				
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	30.0	15.0	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		9.0		56.0	125
Subject objectives	Understanding of the origins, evolution and development forecasts of GIS. Understanding the function and essence of GIS in the decision-making process. Understanding the significance of data standardization and data conversion in GIS.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K6_U07] can use reference systems and coordinate frames according to the character of cartographic studies, create a thematic map and apply in practice cartographic generalization		The student is able to use data exchange standards, understands the concepts of topology and uses cartographic mappings.		[SU5] Assessment of ability to present the results of task		
	[K6_W09] has knowledge and understands the concepts of marine hydrography, sea maps and coastal regions maps, as well as topographic and bathymetric surveys and spatial information systems including their supply with geodetic and hydrographic data		The student is able to use data exchange standards, understands the concepts of topology and uses cartographic mappings.		[SW3] Assessment of knowledge contained in written work and projects		
	[K6_U05] is able to develop a simple algorithm and prepare a simple program in object-oriented language taking into account the geodetic specifics and the specificity of spatial information systems		The student is able to use the result of other programs to power or expand the capabilities of the SIP.		[SU5] Assessment of ability to present the results of task		

Subject contents	The origins, evolution and development forecasts of GIS as a definition and conceptual scope compared to other information systems. GIS technologies in the decision-making process. Modelling, model concept. Data models: hierarchical, network, relational, object-oriented, object-relational (in the context of GIS). Metadata, harmonization and standardization. Components / modules of standard Spatial Information Systems and basic concepts related to the subject (GIS, LIS, LBS, CAD, CAM, geoinformation, data, attributes, spatial information, redundancy). Data conversion (problem description, descriptive data conversion, spatial data conversion with popular languages, formats and standards: XML, SGML, GML, DXF and their inheritables) - in the aspects of GIS. Information about the relational data base model extended with the structural language of SQL queries and its practical use, query optimization and a construction of dedicated data structures. Normalization of a relational database. Hybrid databases. Data visualization. Rasters model (raster model transformations), image algebra and histogram. Vector data model: simple and topological. Disadvantages (advantages), construction of each type and scope of the stored information. Transformations and geometric corrections of data stored in the vector model. Problems of point, line and surface objects description, enclaves and others. Fundamental problems and mistakes occurring during the process of obtaining vector model data.		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
		60.0%	75.0%
		80.0%	25.0%
Recommended reading	Basic literature	1. David E. Davis „Gis for everyone"	
		2. P. Longley, M. Goodchild, D. Maguire, D. Rhind "New Developments in Geographical Information Systems: Principles, Techniques, Management and Applications"	
	Supplementary literature	1. Paul DuBois „MySQL"	
	eResources addresses	Adresy na platformie eNauczanie:	
Example issues/ example questions/ tasks being completed			
Work placement	Not applicable		

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