



Subject card

Subject name and code	Geographic Information Systems, PG_00058935						
Field of study	Informatics						
Date of commencement of studies	October 2025		Academic year of realisation of subject			2027/2028	
Education level	first-cycle studies		Subject group			Optional subject group Subject group related to scientific research in the field of study	
Mode of study	Part-time studies		Mode of delivery			at the university	
Year of study	3		Language of instruction			Polish	
Semester of study	5		ECTS credits			5.0	
Learning profile	general academic profile		Assessment form			exam	
Conducting unit	Department of Geoinformatics -> Faculty of Electronics Telecommunications and Informatics -> Wydział Politechniki Gdańskiej						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. inż. Zbigniew Łubniewski				
	Teachers		dr hab. inż. Zbigniew Łubniewski dr hab. inż. Marcin Kulawiak				
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	0.0	15.0	0.0	45
	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	45		5.0		75.0	125
Subject objectives	Learning by students on basic knowledge and practical skills on Geographical Information Systems (GIS), what includes both using GIS and elements of programming for basic GIS functions implementation.						
Learning outcomes	Course outcome		Subject outcome			Method of verification	
	[K6_U03] can design, according to required specifications, and make a simple device, facility, system or carry out a process, specific to the field of study, using suitable methods, techniques, tools and materials, following engineering standards and norms, applying technologies specific to the field of study and experience gained in the professional engineering environment		Student is able to design and to develop an IT solution which implements a given functionality of geographic information system.			[SU1] Assessment of task fulfilment	
	[K6_W04] knows and understands, to an advanced extent, the principles, methods and techniques of programming and the principles of computer software development or programming devices or controllers using microprocessors or programmable elements or systems specific to the field of study, and organisation of systems using computers or such devices		Student knows the methods and techniques of geographic information systems programming.			[SW1] Assessment of factual knowledge	

Subject contents	1. GIS - definition, concepts, structure and basic terms 2. Examples of GIS applications 3. Data models in GIS 4. Vector data model. Basic vector data types: point, line, polygon. Thematic maps 5. Composed vector data types 6. Raster data model in GIS 7. Vector and raster data formats in GIS 8. Database as a GIS foundation. GIS database types: relational, object-oriented. Specific features of databases used for spatial attributes storage 9. Database queries using spatial attributes of data 10. Standardisation of vector data models. OGC, SQL 11. Topological model of vector data in GIS. Topology rules 12. Three-dimensional data models and representations in GIS 13. GIS data sources and acquiring methods. Import and processing of existing data, geocoding 14. Examples of GIS data measurement techniques 15. Vector data processing algorithms. Geometrical transformations and analysis		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Written exam	50.0%	50.0%
	Project	50.0%	50.0%
Recommended reading	Basic literature	1. Longley P., Goodchild M., Maguire D., Rhind D. "Geographic Information Systems and Science", John Wiley & Sons Ltd., West Sussex 2005 2. Litwin L., Myrda G. "Systemy Informacji Geograficznej. Zarządzanie danymi przestrzennymi w GIS, SIP, SIT, LIS", Wydawnictwo HELION, Gliwice 2005	
	Supplementary literature	No requirements.	
	eResources addresses		
Example issues/ example questions/ tasks being completed			
Work placement	Not applicable		

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