



Subject card

Subject name and code	Geographical Information Systems, PG_00047876						
Field of study	Informatics						
Date of commencement of studies	October 2021	Academic year of realisation of subject			2023/2024		
Education level	first-cycle studies	Subject group			Optional subject group 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	3	Language of instruction			Polish		
Semester of study	5	ECTS credits			2.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	Department of Geoinformatics -> Faculty of Electronics, Telecommunications and Informatics						
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Zbigniew Łubniewski					
	Teachers	dr hab. inż. Zbigniew Łubniewski dr hab. inż. Marcin Kulawiak dr inż. Marek Kulawiak					
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	15.0	0.0	0.0	30
	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	30		2.0		18.0	50
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_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 basics of GIS applications software development.			[SW1] Assessment of factual knowledge		
	[K6_W03] Knows and understands, to an advanced extent, the construction and operating principles of components and systems related to the field of study, including theories, methods and complex relationships between them and selected specific issues - appropriate for the curriculum	Student knows models and formats of spatial data and their applications as well as the architecture of modern GIS. Student knows basic functionality and sample applications of Geographic Information Systems.			[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 16. Layers composition and basic geoprocessing operations: buffering, union, intersection		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Midterm colloquium	50.0%	50.0%
	Practical exercise	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	Adresy na platformie eNauczenie: Systemy Informacji Przestrzennej - Moodle ID: 26978 https://enauczenie.pg.edu.pl/moodle/course/view.php?id=26978	
Example issues/ example questions/ tasks being completed			
Work placement	Not applicable		