GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Geographic Information Systems, PG_00058935		
Field of study	Informatics		
Date of commencement of studies	October 2026	Academic year of realisation of subject	2028/2029
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 -> Faculties of Gdańsk University of Technology		
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

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_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
[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

<table>
<tr><td>Subject contents</td><td>Course content – lecture
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</td></tr>
<tr><td>Prerequisites and co-requisites</td><td></td></tr>
<tr><td>Assessment methods and criteria</td><td>
<table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>Project</td><td>50.0%</td><td>50.0%</td></tr>
<tr><td>Written exam</td><td>50.0%</td><td>50.0%</td></tr>
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</td></tr>
<tr><td rowspan="3">Recommended reading</td><td>Basic literature</td><td>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</td></tr>
<tr><td>Supplementary literature</td><td>No requirements.</td></tr>
<tr><td>eResources addresses</td><td></td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td></td></tr>
<tr><td>Practical activites within the subject</td><td>Not applicable</td></tr>
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