GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Geospatial Data Processing Technologies, PG_00054226		
Field of study	Space and Satellite Technologies		
Date of commencement of studies	February 2026	Academic year of realisation of subject	2026/2027
Education level	second-cycle studies	Subject group	Specialty 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	1	Language of instruction	Polish
Semester of study	2	ECTS credits	3.0
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	

Lesson types

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	15.0	0.0	30.0	0.0	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	8.0	22.0	75

Subject objectives

Learning by students on knowledge and practical skills on technologies for spatial data acquisition, representation and processing

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K7_W04] Knows and understands, to an increased extent, processes occurring in the life cycle of equipment, objects and technical systems, including software systems.	Student has the knowledge on building and maintenance of geopraphical information systems.	[SW1] Assessment of factual knowledge
[K7_U07] Identifies and describes technical problems and is able to solve them choosing the relevant methods and tools. Is able to select and use the appropriate, also the advanced, IT solution for the specific problem in the field of space and satellite technologies.	Student is able to use various IT solutions, including software development by one-self, for processing and analysis of geospatial data.	[SU1] Assessment of task fulfilment [SU2] Assessment of ability to analyse information [SU3] Assessment of ability to use knowledge gained from the subject [SU4] Assessment of ability to use methods and tools
[K7_W06] Has well-ordered and extended knowledge on ICT in space and satellite engineering. Has well-ordered and extended knowledge about potential, methods and application areas of satellite remote sensing and Earth observation as well as about the structure of individual segments, principles of operation and applications of satellite navigation systems.	Student has the knowledge on acquisition, representation, processing, analysis, presentation and sharing the geospatial data, especially satellite imagery.	[SW1] Assessment of factual knowledge

<table>
<tr><td>Subject contents</td><td>Course content – lecture

Introduction to GIS: definitions, functions, applications; spatial data models: raster, vector, vector with topology, TIN; data types and sources for GIS, spatial data representation standards; geographic and cartographic coordinate systems; popular GIS applications (Quantum GIS, ArcGIS, others); spatial databases, spatial operators, SQL spatial extensions, spatial indexing; geocoding; geoprocessing of vector data, spatial data analysis

Course content – laboratory

- Basics of working with GIS: raster and vector data, thematic layers and their visualization, searching in GIS, spatial operators

- Geoprocessing tools and their applications

- Spatial analysis in GIS

- Implementing simple GIS as elements of web portal using JavaScript libraries (OpenLayers)

- Using KML files and external geocoding tools</td></tr>
<tr><td>Prerequisites and co-requisites</td><td>No requirements</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>Written exam</td><td>50.0%</td><td>30.0%</td></tr>
<tr><td>Practical exercise</td><td>50.0%</td><td>50.0%</td></tr>
<tr><td>Midterm colloquium</td><td>50.0%</td><td>20.0%</td></tr>
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<tr><td>Recommended reading</td><td>
<table>
<tr><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. Richards J. "Remote Sensing Digital Image Analysis", Springer-Vergal Berlin Heidelberg 1986 and 1993</td></tr>
<tr><td>Supplementary literature</td><td>No requirements</td></tr>
<tr><td>eResources addresses</td><td></td></tr>
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<tr><td>Example issues/ example questions/ tasks being completed</td><td>Not provided.</td></tr>
<tr><td>Practical activites within the subject</td><td>Not applicable</td></tr>
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