GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Geographical information Systems, PG_00042795						
Field of study	Environmental Engineering						
Date of commencement of studies	October 2026		Academic year of realisation of subject	2026/2027			
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	1		Language of instruction	Polish			
Semester of study	1		ECTS credits	2.0			
Learning profile	general academic profile		Assessment form	assessment			
Conducting unit	Department of Geodesy -> Faculty of Civil and Environmental Engineering -> Faculties of Gdańsk University of Technology						
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Adam Inglot					
	Teachers						

Lesson types

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	15.0	15.0	0.0	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	5.0	20.0	55

Subject objectives

Understanding the origins, evolution and development forecasts for GIS and GIS functions in decision-making, as well as the importance of standardization and sharing of data in the GIS.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_U05] can apply in engineering practice the basic geodetic instruments and instruments, make measurement sketches and read information from the map and surveying documents	The student is able to read information from standard cartographic studies.	[SU4] Assessment of ability to use methods and tools
[K6_W15] knows the rules of descriptive geometry and technical drawing regarding the recording and reading of architectural drawings, construction and surveying drawings, as well as their preparation with the use of CAD	The student has a basic knowledge of the tools of spatial information systems for the preparation of cartographic studies or technical drawings.	[SW3] Assessment of knowledge contained in written work and projects
[K6_W16] has basic knowledge of geodesy in the range of applied measurement equipment and techniques, geodetic information systems and documentation necessary in the preparation process, investment implementation	The student has a basic knowledge of spatial information systems.	[SW3] Assessment of knowledge contained in written work and projects

Subject contents	Course content – lecture The lecture introduces students to the fundamental concepts of Spatial Information Systems (SIS) and their significance in environmental engineering. The topics cover the origin, evolution, and applications of GIS technologies in decision-making, planning, and environmental monitoring. Students become familiar with the main components and functions of spatial information systems, including GIS, SIT, and LIS, as well as the basic terminology of geoinformation and spatial data structures. The course discusses data modelswith emphasis on the relational modeltogether with database normalization and the practical use of SQL for spatial data analysis. Attention is also given to data exchange standards such as GML and DXF, as well as visualization techniques for spatial data and thematic mapping. The lecture provides a theoretical foundation for understanding the role of GIS tools in modern spatial and environmental analyses. Course content – exercises The practical classes enable students to apply theoretical knowledge by working with basic GIS software and data. Students learn to read and interpret spatial data, maps, and technical drawings, and to combine descriptive and spatial data in simple analyses. During the exercises, they perform basic GIS operations such as data input, editing, and visualization, as well as spatial relationship analyses and thematic map creation. The classes also introduce the relational data model and the use of SQL queries for spatial data exploration. The goal of the exercises is to develop practical skills in the use of GIS tools and spatial data handling in the context of environmental engineering applications.
Prerequisites and co-requisites	
Assessment methods and criteria	

Subject passing criteria	Passing threshold	Percentage of the final grade
report	50.0%	50.0%
test	50.0%	50.0%

Recommended reading	Basic literature	1. P.Longley, M.Goodchild, D.Maguire, D.Rhind GIS Teoria i praktyka 2. DavidE.Davis Gis dla każdego 3. Jerzy Gaździcki Systemy Informacji przestrzennej 4. Bielecka, Elżbieta. Systemy informacji geograficznej: teoria i zastosowania. Wydawnictwo Polsko-Japońskiej Wyższej Szkoły Technik Komputerowych, 2006. 5. Laska, M., Systemy informacji przestrzennej 6. Litwin, L., Myrda, G., Systemy Informacji Geograficznej. Zarządzanie danymi przestrzennymi w GIS, SIP, SIT, LIS. 7. Urbański, J. GIS w badaniach przyrodniczych
	Supplementary literature	8. J.Pomykała,J.Pomykała Systemy informacyjne 9. M.Kraak,F.Ormeling Kartografia wizualizacja danych przestrzennych 10. A.Magnuszewski GIS w geografii fizycznej 11. Gotlib D., Iwaniak A., Olszewski R.: GIS. Obszary zastosowań. Wyd. Naukowe PWN. Warszawa. 2007
	eResources addresses	

Example issues/ example questions/ tasks being completed	1. Replace the components and functions of SIP 2. Introduce the impact of the curvature of the Earth on engineering calculations. 3. Describe principles of topology collection 4. Characterize the importance of data exchange standards for engineering work 5. Replace and present examples of cartographic representation and coordinate systems in force in Poland and in Europe generally.
Practical activites within the subject	Not applicable

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