



## Subject card

Subject name and code	Geographic Information System - GIS I, PG_00049235						
Field of study	Spatial Development						
Date of commencement of studies	October 2022		Academic year of realisation of subject		2023/2024		
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	2		Language of instruction		Polish		
Semester of study	4		ECTS credits		3.0		
Learning profile	general academic profile		Assessment form		assessment		
Conducting unit	Department of Urban Design and Regional Planning -> Faculty of Architecture						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. arch. Weronika Mazurkiewicz				
	Teachers		dr inż. arch. Weronika Mazurkiewicz Justyna Wiczerzak				
Lesson types and methods of instruction	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		5.0		25.0	75
Subject objectives	Students learn the basic tools of the GIS environment and QGIS program. The course is intended for beginners to work with spatial data. The course covers such issues as: basic geoprocessing tools, acquiring spatial information resources, creating and processing vector data, working with raster data, building analytical models. Students acquire the ability to use GIS tools in the process of investment planning, spatial planning and environmental analyzes.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[K6_K02] comprehending technical and non-technical aspects and effects of its activity, initiates various activities for the public interest, including co-organizing social projects, workshops and public debates on issues related to spatial management, within which it can reliably present a problem on a non-professional forum and explain the methods and solutions used	The student knows the technical and non-technical aspects of the use of GIS tools. Has the ability to initiate GIS-based projects. Student knows which tools for the project to choose and knows how to characterize them.	[SK5] Assessment of ability to solve problems that arise in practice
	[K6_U07] evaluates the usefulness of standard methods and tools used in planning and management of spatial development and is able to select and apply the most appropriate ones	The student is able to use GIS tools in planning practice and has the ability to select GIS tools in the city development management process.	[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
	[K6_K01] critically evaluates the received content; Recognizes the importance of knowledge in solving cognitive and practical problems; it reflects on the ethical, scientific and social aspects related to the urban planner and planner's work	The student knows where to obtain and how to select data sources, subject them to critical analysis, select processing tools and use them in spatial analyzes, being able to interpret the results.	[SK5] Assessment of ability to solve problems that arise in practice
	[K6_W03] has elementary knowledge in the field of mathematics and physics relating to issues related to space management, including the basic mathematical methods used in urban design, as well as analytical and design methods using information technology used in planning processes of settlement structures	The student knows the technical and non-technical aspects of the use of GIS tools. Has the ability to initiate GIS-based projects and select analytical tools. Student knows how to use the database, the field calculator, knows the basic commands in the python console.	[SW3] Assessment of knowledge contained in written work and projects
Subject contents	<p>Block 1 Getting to know the GIS environment: Geographic data, Program interface and specificity of work in GIS. Use of internet map servers. Databases in geoinformation systems. Creating a spatial database. Data recording formats. Preparation of data for presentation in the form of a map composition. Ways of data presentation. Block 2 GIS as a tool for statistical analysis: GIS databases. Basic GIS tools. GIS as a tool of statistical analysis. Search and organize geographic data. Acquisition of statistical data and their georefaction. Creating choropleth maps and diagrams cards Block 3 GIS - basic geoprocessing tools: Introduction to geoprocessing tools - getting to know the so-called simple tools such as buffer, product, sum, difference, symmetric difference, aggregation, trimming. Work in the attribute table. Create primary fields for further analysis - create primary fields of various shapes on a selected GIS layer. Performing calculations of statistical measures in individual primary fields and comparing the results obtained for different primary fields. Raster calibration. Creating and advanced editing of vector objects (points, lines, polygons) and completing the attribute table according to the guidelines Block 4 GIS in spatial planning: Introduction to vectorization and data editing. Use of network services. Layer styling. Topology and topological validation of data - Checking the correctness and accuracy of the prepared data by examining the spatial relations between objects, i.e. boundary, adjoining, containing, connectivity. Processing of planning documents. Raster calibration. Creating and advanced editing of vector objects (points, lines, polygons) and completing the attribute table according to the guidelines Block 5 Supporting planning decisions - introduction to urban analysis :. Estimating the absorptive capacity of areas. Analysis tools - detecting the nature of spatial distribution of data and presenting spatial relationships by transforming raw geographic data. Data management tools combining attributes, changing the coordinate system. Geocoding tools. Basic statistical calculations - Performing basic statistical analyzes for selected data series using the EXCEL software Block 6 Network and accessibility analyzes, terrain route modeling: GIS as a support tool for road infrastructure management. Filtering linear objects. Network analyzes. Accessibility analysis, matrix of spatial connections. Access route analysis. Availability buffers. Creation of aggregate meshes Block 7 Cluster maps and the designer model: Introduction to advanced geoprocessing tools. Creation of cluster maps. Building analytical models The lectures cover the following issues: Admission to classes, Introduction to GIS where is it applicable? Introduction to GIS basic concepts Basic sources of spatial data. Complementary data sources for GIS analyzes Spatial services Legal bases related to the acquisition and use of spatial information GIS in spatial planning GIS as a tool to improve city management GIS as a spatial monitoring tool</p>		
Prerequisites and co-requisites			

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	test from the lecture part	60.0%	10.0%
	timely and correct execution of all tutorials	90.0%	30.0%
	timely completion of all homework	90.0%	30.0%
	completing the task of completing the laboratory	60.0%	30.0%
Recommended reading	Basic literature	1. Bielecka E., Systemy informacji geograficznej. Teoria i zastosowania, Wyd. PJWSTK, Warszawa 2006  3. Gotlib D., Iwaniak A., Olszewski R., GIS. Obszary zastosowań, PWN, Warszawa 2008  4. Januszewski J., Systemy satelitarne GPS, Galileo i inne, PWN, Warszawa 2006  5. Kraak-Menno J., Ormeling F., Kartografia-wizualizacja danych przestrzennych, PWN, Warszawa 1998  6. Kurczyński Z., Preuss R., Podstawy fotogrametrii, Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa 2004  8. Longley P.A., Goodchild M.F., Rhind D.W., Magnuszewski A. (red.), GIS Teoria i praktyka, PWN, Warszawa 2006  9. Magnuszewski A., GIS w geografii fizycznej, PWN, Warszawa 1999  10. Paślawski J. (red.), Wprowadzenie do kartografii i topografii, Wyd. Nowa Era, 2006  11. Urbański J., GIS w badaniach przyrodniczych, Wyd. Uniw. Gdańskiego, Gdańsk 2008	
	Supplementary literature	1. Przewłocki S., Geomatyka, Wyd. Naukowe PWN, W-wa 2008  2. Sanecki J. (red.), Teledetekcja. Pozyskiwanie danych, Wyd. WNT, W-wa 2006  3. Specht C., System GPS, Bernardinum, Gdańsk 2007  4. Werner P., Wprowadzenie do systemów geoinformacyjnych, W-wa 2004	
	eResources addresses	Adresy na platformie eNauczanie:	
Example issues/ example questions/ tasks being completed	Calculation of the absorptive capacity of land intended for housing development in the study of the conditions and directions of development of a commune.Preparation of an analytical model for the selection of plots that can be developed under certain criteria.Estimating the number of people living in the area of pedestrian accessibility to services.Preparation of a choropleth map showing the dynamics of spatial changes.Vectorization of the local spatial development plan.		
Work placement	Not applicable		