



## Subject card

Subject name and code	Geographic Information System - GIS III - problem solving - link to law, PG_00068348						
Field of study	Spatial Development						
Date of commencement of studies	October 2026	Academic year of realisation of subject			2027/2028		
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 -> Faculties of Gdańsk University of Technology						
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. arch. Weronika Mazurkiewicz					
	Teachers						
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	5.0	25.0	75		
Subject objectives	The course focuses on digital tools and standards used in contemporary spatial planning, taking into account recent legislative changes and the reform of Poland's planning system. Students work with documents such as the municipal master plan (POG) and local spatial development plans (mpzp), preparing them in compliance with current regulations. The classes are hands-on and conducted in QGIS and ArcGIS environments using the APP component and cover, among other topics, symbolization, the delineation of planning zones, areas for infill development (OUZ), urban core zones, and social infrastructure accessibility standards, as well as the creation of spatial data sets for planning instruments. In addition, students explore the integration of strategic planning with spatial planning by developing a simplified functional spatial structure model of a municipality.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[K6_U03] acquires, collects and classifies information in the field of spatial management from a variety of sources, including literature, databases, electronic sources, field observations, surveys and interviews; can perform urban and ruralistic inventory	The student is able to acquire and process spatial data from various sources (databases, registers, GIS), use tools such as QGIS, ArcGIS, and the APP plugin to prepare planning documents (POG, local plans), as well as analyze land development capacity, designate planning zones, infill development areas (OUZ), and social infrastructure accessibility zones. They can develop a simplified functional-spatial structure model of a municipality in the context of development strategy and present the results in compliance with current regulations.	[SU5] Assessment of ability to present the results of task [SU4] Assessment of ability to use methods and tools [SU2] Assessment of ability to analyse information [SU1] Assessment of task fulfilment
	[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 assess the suitability of standard methods and tools used in spatial planning and development management, and to select and apply the most appropriate ones—particularly digital tools such as QGIS, ArcGIS, and the APP plugin—when working on planning documents (POG, local plans), spatial analyses, and models supporting strategic municipal development.	[SU5] Assessment of ability to present the results of task [SU2] Assessment of ability to analyse information [SU4] Assessment of ability to use methods and tools
Subject contents	<p>Course content – lecture</p> <p><b>Block 1: Introduction to the Digitization of Spatial Planning</b> Lectures 12: Digitization of spatial planning system reform, GML, urban planning register, types of planning documents. Lab 1: Selection of a municipality for analysis, installation of the APP plugin and required tools. Lab 2: Creating a symbology file according to regulations (local zoning plan) ArcGIS.</p> <p><b>Block 2: General Municipal Plan Analysis of Residential Areas</b> Lectures 34: General municipal plan and residential area balance (QGIS). Lab 3: Data collection and calculation of residential development demand. Lab 4: Analysis of the development capacity of undeveloped land.</p> <p><b>Block 3: Planning Zones in the General Plan (POG)</b> Lectures 56: Planning zones creation in QGIS using APP 2. Labs 56: Drawing planning zones in APP.</p> <p><b>Block 4: Infill Areas, City Core Zone, Accessibility Standards</b> Lectures 78: Infill development area (OUZ), city core zone, accessibility to social infrastructure. Labs 78: Defining the OUZ step by step using the plugin.</p> <p><b>Block 5: Spatial Data Sets in APP</b> Lectures 910: Spatial data sets structure and requirements. Labs 910: Creating data sets for the General Plan and local zoning plans (georeferencing).</p> <p><b>Block 6: Functional and Spatial Model of the Municipality</b> Lectures 1112: Functional and spatial structure model in development strategy. Labs 1112: Gathering components of the model in accordance with Art. 10e of the Spatial Planning Act and preparing graphic representations. Lectures 1314: Integrated spatial planning and upper levels of planning in relation to GIS. Labs 1314: Continuing the development of the functional-spatial structure model.</p> <p><b>Block 7: Summary and Presentation of Student Work</b> Lecture 15: Examination geographic information systems. Lab 15: Presentation of functional-spatial models developed by students.</p>		

Prerequisites and co-requisites	<p>Completed courses:</p> <p>PG_00068064_INFORMATION TECHNOLOGIES GIS I INVENTORY and PG_00068136_Geographic Information System GIS II Mapping</p>		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Final exam for the course	51.0%	60.0%
	Work during laboratories	51.0%	40.0%
Recommended reading	Basic literature	<ol style="list-style-type: none"> <li>1. Bielecka E., Systemy informacji geograficznej. Teoria i zastosowania, Wyd. PJWSTK, Warszawa 2006</li> <li>2. Ciołkosz A., Miszański J., Olędzki J.R., Interpretacja zdjęć lotniczych, Wyd. Naukowe PWN, Warszawa 1999</li> <li>3. Gotlib D., Iwaniak A., Olszewski R., GIS. Obszary zastosowań, PWN, Warszawa 2008</li> <li>4. Januszewski J., Systemy satelitarne GPS, Galileo i inne, PWN, Warszawa 2006</li> <li>5. Kraak-Menno J., Ormeling F., Kartografia-wizualizacja danych przestrzennych, PWN, Warszawa 1998</li> <li>6. Kurczyński Z., Preuss R., Podstawy fotogrametrii, Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa 2004</li> <li>7. Kwietniewski M., GIS w wodociągach i kanalizacji, PWN, Warszawa 2008</li> <li>8. Longley P.A., Goodchild M.F., Rhind D.W., Magnuszewski A. (red.), GIS Teoria i praktyka, PWN, Warszawa 2006</li> </ol>	
	Supplementary literature	<ol style="list-style-type: none"> <li>9. Magnuszewski A., GIS w geografii fizycznej, PWN, Warszawa 1999</li> <li>10. Paślowski J. (red.), Wprowadzenie do kartografii i topografii, Wyd. Nowa Era, 2006</li> <li>11. Suchecki B., Ekonometria przestrzenna. Metody i modele analizy danych przestrzennych, Wyd. C.H. Beck, 2010</li> <li>12. Urbański J., GIS w badaniach przyrodniczych, Wyd. Uniw. Gdańskiego, Gdańsk 2008</li> <li>13. van Nes, A., Yamu, C., Introduction to Space Syntax in Urban Studies, Springer, 2021.</li> </ol>	
	eResources addresses		

<p>Example issues/ example questions/ tasks being completed</p>	<ul style="list-style-type: none"> <li>• The digitization process in spatial planning and recent legislative reforms</li> <li>• Understanding and using GML (Geography Markup Language) in planning documents</li> <li>• Types of planning documents: municipal master plans (POG) and local spatial development plans (mpzp)</li> <li>• Installation and use of the APP plugin in QGIS and ArcGIS environments</li> <li>• Creation and application of symbology files according to planning regulations</li> <li>• Methods for assessing residential land demand and capacity</li> <li>• Drawing and interpreting planning zones using GIS tools</li> <li>• Defining infill development areas (OUZ) and urban core zones in spatial plans</li> <li>• Accessibility standards for social infrastructure in planning</li> <li>• Preparation and management of spatial data sets for planning purposes</li> <li>• Building simplified functional and spatial structure models of municipalities</li> <li>• Integration of strategic planning with spatial planning and GIS</li> <li>• Interpretation and presentation of spatial data and planning models</li> </ul>
<p>Practical activities within the subject</p>	<p>Not applicable</p>

Document generated electronically. Does not require a seal or signature.