GDAŃSK UNIVERSITY OF TECHNOLOGY

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 2025	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	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 -> Wydziały Politechniki Gdańskiej		
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. arch. Weronika Mazurkiewicz	
	Teachers		

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	The course focuses on digital tools and standards used in contemporary spatial planning, taking into account recent legislative changes and the reform of Polands 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 handson and conducted in QGIS and ArcGIS environmentsusing the APP componentand 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 functionalspatial structure model of a municipality.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[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.	[SU4] Assessment of ability to use methods and tools [SU2] Assessment of ability to analyse information [SU5] Assessment of ability to present the results of task
[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.	[SU1] Assessment of task fulfilment [SU2] Assessment of ability to analyse information [SU4] Assessment of ability to use methods and tools [SU5] Assessment of ability to present the results of task

Subject contents

Block 1: Introduction to the Digitization of Spatial Planning
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.

Block 2: General Municipal Plan Analysis of Residential Areas
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.

Block 3: Planning Zones in the General Plan (POG)
Lectures 56: Planning zones creation in QGIS using APP 2.
Labs 56: Drawing planning zones in APP.

Block 4: Infill Areas, City Core Zone, Accessibility Standards
Lectures 78: Infill development area (OUZ), city core zone, accessibility to social infrastructure.
Labs 78: Defining the OUZ step by step using the plugin.

Block 5: Spatial Data Sets in APP
Lectures 910: Spatial data sets structure and requirements.
Labs 910: Creating data sets for the General Plan and local zoning plans (georeferencing).

Block 6: Functional and Spatial Model of the Municipality
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.

Block 7: Summary and Presentation of Student Work
Lecture 15: Examination geographic information systems.
Lab 15: Presentation of functional-spatial models developed by students.

Prerequisites and co-requisites	Completed courses: PG_00068064_INFORMATION TECHNOLOGIES_GIS I INVENTORY and PG_00068136_Geographic Information System GIS II Mapping

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Work during laboratories	51.0%	40.0%
Final exam for the course	51.0%	60.0%

Recommended reading

Basic literature

1. Bielecka E., Systemy informacji geograficznej. Teoria i zastosowania, Wyd. PJWSTK, Warszawa 2006
2.Ciołkosz A., Miszalski J., Olędzki J.R., Interpretacja zdjęć lotniczych, Wyd. Naukowe PWN, Warszawa 1999
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
7. Kwietniewski M., GIS w wodociągach i kanalizacji, PWN, Warszawa 2008
8. Longley P.A., Goodchild M.F., Rhind D.W., Magnuszewski A. (red.), GIS Teoria i praktyka, PWN, Warszawa 2006

Supplementary literature

9. Magnuszewski A., GIS w geografii fizycznej, PWN, Warszawa 1999
10. Pasławski J. (red.), Wprowadzenie do kartografii i topografii, Wyd. Nowa Era, 2006
11. Suchecki B., Ekonometria przestrzenna. Metody i modele analizy danych przestrzennych, Wyd. C.H, Beck, 2010
12. Urbański J., GIS w badaniach przyrodniczych, Wyd. Uniw. Gdańskiego, Gdańsk 2008
13. van Nes, A., Yamu, C., Introduction to Space Syntax in Urban Studies, Springer, 2021.

eResources addresses

Example issues/ example questions/ tasks being completed	• The digitization process in spatial planning and recent legislative reforms • Understanding and using GML (Geography Markup Language) in planning documents • Types of planning documents: municipal master plans (POG) and local spatial development plans (mpzp) • Installation and use of the APP plugin in QGIS and ArcGIS environments • Creation and application of symbology files according to planning regulations • Methods for assessing residential land demand and capacity • Drawing and interpreting planning zones using GIS tools • Defining infill development areas (OUZ) and urban core zones in spatial plans • Accessibility standards for social infrastructure in planning • Preparation and management of spatial data sets for planning purposes • Building simplified functional and spatial structure models of municipalities • Integration of strategic planning with spatial planning and GIS • Interpretation and presentation of spatial data and planning models
Work placement	Not applicable

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