GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Environmental principles of spatial development, PG_00068150		
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	3	ECTS credits	3.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Departrnent of Spatial Planning -> Faculty of Architecture -> Faculties of Gdańsk University of Technology		
Name and surname of lecturer (lecturers)	Subject supervisor	dr Miłosz Marciniak	
	Teachers		

Lesson types

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

Developing skills of using knowledge about the natural environment for the needs of spatial planning, and urban and rural design.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_W04] has knowledge in the field of pro-ecological design and knows the principles of sustainable development of cities and regions; has knowledge of the natural foundations of spatial management and the impact of natural conditions on the processes of economic development on a local, regional and national scale	The student demonstrates an understanding of the nature and complexity of environmental design processes across various spatial units and scales, with particular emphasis on the area's physiographic characteristics and the design objectives	[SW1] Assessment of factual knowledge [SW3] Assessment of knowledge contained in written work and projects
[K6_U05] correctly interprets natural phenomena, and when formulating and solving engineering tasks related to spatial management, notices their systemic and non-technical aspects related to the natural environment	The student is able to identify natural phenomena, interpret their impact on the requirements of engineering tasks related to spatial planning, and assess systemic, technical, and non-technical relationships concerning the natural environment.	[SU4] Assessment of ability to use methods and tools [SU1] Assessment of task fulfilment

Subject contents	Course content – lecture Characteristics of the natural environment and its components (topography, geological structure and grounds, soils, groundwater, surface water, vegetation, climate and topoclimate). Assessment of the natural environment for economic purposes, for the needs of urban planning and spatial planning. Discussion of the impact of the development of environmental features on the possibilities of land use and restrictions on the use of the area with given features introduced by some environmental features. Assessment of conditions and location options for various objects. Declines in land - land suitability for construction and agriculture. Equal slope lines, longitudinal profile, site suitability assessment for transport needs. SMGP and geological and engineering atlases. Soil load capacity. Approximate suitability of land for development. Risk assessment for mass movements. SOPO system. Landslides and threatened areas registers. Soil maps. Soil valuation classes and agricultural suitability complexes. Site analysis from the point of view of the protection of agricultural and forest land. Site analysis from the point of view of suitability for construction. Hydrographic and hydrogeological map. Soil permeability and groundwater flow direction. Usefulness of the development area due to the depth of 1 groundwater horizon. Main groundwater reservoirs. Limits of local (natural and urbanized) catchments. Plotting the topographic border of the catchment area. Hydrographic map, KZGW website. Impact of surface water runoff on transport and construction. Determining the boundaries of the floodplain. Consequences of flooding for buildings and people. PSH base - areas at risk of flooding. ISOK system. Forest habitat types, their physiognomy and resistance to anthropopressure, forest management, Health properties of selected plant communities. Forest data bank. RDLP services. Assessment of conditions and location options for various objects - sozological and geoenvironmental maps. EMSGP system. Protected areas - GDoś geoservice, Map of ecological corridors in Poland. Climatic elements (temperature, precipitation, humidity). Sources of climate data. Designation of sunny and shaded areas. Typical meteorological year. ARMAAG system. Cooling air flow directions. Areas potentially exposed to cold air stagnation. Air flow - ventilating the area. Topoclimate of the city. Climate valorization of urban areas.
Prerequisites and co-requisites	Knowledge about the natural environment from earlier stages of education.
Assessment methods and criteria	

Subject passing criteria	Passing threshold	Percentage of the final grade
test from lecture content	60.0%	50.0%
6-8 exercises	100.0%	50.0%

Recommended reading	Basic literature	Macias A., Bródka S., Przyrodnicze podstawy gospodarowania przestrzenią. PWN, Warszawa, 2014. Szponar A., Fizjografia urbanistyczna. PWN, Warszawa, 2003. Oke T.R., Mills G., Christen A., Voogt J.A, Urban Climates, Cambridge University Press, 2017 (https://aerisfuturo.pl/projekt/urban-climates/) Błażejczyk K. i in., Miejska wyspa ciepła w Warszawie. Uwarunkowania klimatyczne i urbanistyczne. IGiPZ PAN, Wyd. Akademickie Sedno, Warszawa, 2014. Ustawy, rozporządzenia i normy

	Supplementary literature	Kaczyński R.R., Warunki geologiczno-inżynierskie na obszarze Polski. Państwowy Instytut Geologiczny, 2017. Saternus P., Leksykon urbanistyki i planowania przestrzennego. BEL Studio, Warszawa, 2013. Krzyk P., Kotuła Ł., Uwarunkowania geologiczno-inżynierskie i geotechniczne w planowaniu przestrzennym z uwzględnieniem obszarów osuwiskowych. Instytut Rozwoju Miast, Kraków, 2015. Krzymowska-Kostrowicka A., Geoekologia turystyki i wypoczynku. PWN, Warszawa, 1999. Kowalczak P., Wodne dylematy urbanizacji. Wydawnictwo PTPN, Poznań 2011. Kolerski T., Praktyczne aspekty gospodarki wodnej w projektowaniu zbiorników retencyjnych. PG, 2014. Lewińska J. Klimat miasta - zasoby, zagrożenia, kształtowanie. Instytut Gospodarki Przestrzennej i Komunalnej, Oddział w Krakowie, 2000. Literatura szczegółowa do poszczególnych ćwiczeń.
	eResources addresses	
Example issues/ example questions/ tasks being completed	Assessment of land suitability for the needs of construction and agriculture based on the size of the land fall. Road grade, influence of relief on routing and implementation of a road and railway line. Soil load capacity, maximum load of land useful for building without reservations. Occurrence of mass movements and their impact on buildings. Properties and natural conditions of the area determining the soil soil quality class. Assessment of the possibility of flooding in a given area. Impact of changes in the depth of the first groundwater horizon on construction and underground infrastructure. Possibilities of tourist use of individual types of forest habitat. Factors affecting the city's climate. Areas potentially exposed to cold air stagnation.	
Practical activites within the subject	Not applicable	

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