



Subject card

Subject name and code	Shaping and transformation of urban structures, PG_00065655						
Field of study	Spatial Development						
Date of commencement of studies	February 2026		Academic year of realisation of subject		2026/2027		
Education level	second-cycle studies		Subject group		Optional subject group Specialty subject group 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	2		ECTS credits		3.0		
Learning profile	general academic profile		Assessment form		assessment		
Conducting unit	Department of Spatial Planning -> Faculty of Architecture -> Faculties of Gdańsk University of Technology						
Name and surname of lecturer (lecturers)	Subject supervisor						
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	30.0	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		6.0		24.0	75
Subject objectives	The aim of the course is to introduce students to a range of analytical methods and design solutions used in pro-ecological spatial tranformations of cities and their regions through problem-solving approaches that integrate systems thinking, anticipatory strategic competences, real life scenarios and insights, and interpersonal skills. These methods include assessments of climate sensitivity of the analyzed structures and strategies to enhance their resilience through appropriate spatial planning solutions.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K7_W01] has in-depth and expanded knowledge of spatial development, urban planning and spatial planning, including activities used in the process of revitalization of degraded areas and ecological design		Student knows the essence and complexity of the processes related to the ecological design of cities and regions of the coastal zone, with particular emphasis on the effects of climate change		[SW3] Assessment of knowledge contained in written work and projects [SW2] Assessment of knowledge contained in presentation [SW1] Assessment of factual knowledge		
	[K7_U06] is able to formulate a design specification for a complex planning task, including legal and other non-technical aspects, including such things as social impact and economic efficiency		is able to formulate a design specification for a complex planning task, taking into account legal and other non-technical aspects		[SU1] Assessment of task fulfilment		
	[K7_W04] has in-depth knowledge of issues and technical systems related to the planning, design and implementation of infrastructure projects and urban planning, as well as the life cycle of facilities and systems related to the operation of settlement units		has in-depth knowledge of technical issues and systems related to the planning, design and implementation of infrastructure projects and urban developments, as well as the life cycle of facilities and systems related to the functioning of settlement units		[SW2] Assessment of knowledge contained in presentation		

Subject contents	Course content – lecture Identification and assessment of regional ecological issues affecting cities and other settlement structures. Assessment of the sensitivity and adaptive potential of various spatial structures. General principles of sustainable urban and settlement design while overtaking the holistic landscape approach. Linkages between regional-scale pro-ecological actions and design in a local scale. Determination and using the social, economic and environmental measures and indexes to transform urban structures. Building sustainable development strategies for the urban areas. Ecological design as a tool for environmental protection. Course content – exercises Identification and assessment of regional ecological issues affecting cities and other settlement structures. Assessment of the sensitivity and adaptive potential of various spatial structures. General principles of sustainable urban and settlement design while overtaking the holistic landscape approach. Linkages between regional-scale pro-ecological actions and design in a local scale. Determination and using the social, economic and environmental measures and indexes to transform urban structures. Building sustainable development strategies for the urban areas. Ecological design as a tool for environmental protection.		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Delivering a thematic presentation	100.0%	100.0%
Recommended reading	Basic literature		
	1) Beatley T., Planning for sustainability in European cities: A review of practices in leading cities, [in:] The Sustainable Urban Development Reader, red. T. Beatley, S.M. Wheeler, Topical Urban Readers, The Routledge Urban Reader Series, series editor: LeGates R. T., Stout F., Routledge, Taylor & Francis Group, London-New York 2004. 2) Riddell R., Sustainable urban planning. Blackwell Publishing, 2007. 3) Jenks M., The acceptability of urban intensification, [in:] Achieving Sustainable Urban Form, red. E. Burton, M. Jenks, K. Williams, E & FN Spon, Tailor & Francis Group, London-No York 2001.Kenworthy J., Newman P., Sustainable urban form: The big picture, [in:] Achieving Sustainable Urban Form, red. E. Burton, M. Jenks, K. Williams, E&FN Spon, Tailor & Francis Group, London-New York 2001. 4) A. Sahavacharin, P. Sompongchaiyakul, D.Thaitakoo The effects of land-based change on coastal ecosystems Original Paper Published: 02 April 2022 Volume 18, pages 351366, (2022) 5) Carmona M., Sustainable urban design - a possible agenda, [w:] Planning for a Sustainable Future, red. A. Layard, S. Davoudi, S. Batty, Spon Press, Taylor & Francis Group, London 2001. 6) The effect of climate change and urbanization on outdoor microclimate: A case study in Berlin https://www.sciencedirect.com/science/article/pii/S0378778824001403#f0035 7) How to measure and quantify biogenic carbon removals https://www.umweltbundesamt.de/sites/default/files/medien/11850/publikationen/42_2024_cc_biogenic_carbon_removals.pdf 8) Persson U, Wiechers E, Möller B, Werner S. Heat Roadmap Europe: Heat distribution costs . Energy, 2019, 176: 604-622.		

	Supplementary literature	1) Williams K., Does intensifying cities make them more sustainable? [in:] Achieving Sustainable Urban Form, red. E. Burton, M. Jenks, K. Williams, E&FN Spon, Taylor & Francis Group, London-New York 2001. 2) Selman P., Environmental Planning: The conservation and development of biophysical resources, 2nd edition, SAGE, London, Thousand Oaks, New Delhi 2000. 3) Möller B, Wiechers E, Persson U, Grundahl L, Lund RS, Mathiesen BV. Heat Roadmap Europe: Towards EU-Wide, Local Heat Supply Strategies. Energy, 2019, 177: 554-564. 4) Möller B, Wiechers E, Persson U, Grundahl L, Connolly D. Heat Roadmap Europe: Identifying local heat demand and supply areas with a European thermal atlas. Energy, 2018; 158: 281-292. 5) Persson U, Möller B, Werner S. Heat Roadmap Europe: Identifying strategic heat synergy regions. Energy Policy 2014; 74: 663-681.
	eResources addresses	
Example issues/ example questions/ tasks being completed	1) Environmental conditions influencing climate change and urban environment interactions. 2) Conditions contributing to the urban heat island phenomenon and associated risks. 3) Urban adaptation strategies in response to climate change. 4) Ecological considerations in the design of various settlement structures: key issues. 5) Contemporary challenges of water retention in cities: problems and solutions. 6) Air quality in urban areas: problems and solutions. 7) Forms and functions of urban greenery: structure and spatial characteristics of primary types. 8) Designing tall greenery along urban transport routes and its spatial implications. 9) Ecological linkages of regional importance: examples of planning policies and implemented projects. 10) Ecological linkages of metropolitan importance: examples of planning policies and implemented projects. 11) Methods for assessing the recreational capacity of ecologically valuable areas. 12) Sustainable approaches to developing and utilizing ecologically valuable areas for recreation. 13) Modern mobility in cities and regions that minimizes ecological impact.	
Practical activities within the subject	Not applicable	

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