



Subject card

Subject name and code	Net zero energy building (construction), PG_00055984						
Field of study	Power Engineering, Power Engineering, Power Engineering						
Date of commencement of studies	October 2023	Academic year of realisation of subject				2025/2026	
Education level	first-cycle studies	Subject group				Optional 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	3	Language of instruction				Polish	
Semester of study	6	ECTS credits				3.0	
Learning profile	general academic profile	Assessment form				assessment	
Conducting unit	Department of Building Structures and Material Engineering -> Faculty of Civil and Environmental Engineering -> Faculties of Gdańsk University of Technology						
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Jarosław Florczuk					
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	0.0	15.0	0.0	30
	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	30		8.0		37.0	75
Subject objectives	The aim of the course is to learn the guidelines of the net-zero energy building standard, the actual passive and active techniques to reduce the building's energy demand, and methods of calculating the building's energy demand.						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	[K6_W01] has basic knowledge of mathematics necessary to describe the phenomena related to the processes of energy conversion and transfer; uses information technology to solve mathematical problems	The student uses computational programs based on numerical methods to solve the problem of stationary heat conduction.			[SW3] Assessment of knowledge contained in written work and projects		
	[K6_W10] knows the basic installations in the field of renewable energy sources and their impact on the environment	The student knows the basic installations based on renewable energy sources and their impact on the environment.			[SW1] Assessment of factual knowledge		
	[K6_W16] has an elementary knowledge about energy and environmental construction including building materials, their strength, construction mechanics and building physics, moisture migration in buildings, heat transfer through building partitions, has a basic knowledge of marine and inland hydrotechnical structures; has knowledge of the hydraulic and hydrological conditions of designing facilities and building structures, photogrammetry, remote sensing, hydrography, and spatial analysis.	The student identifies the basic elements of engineering structures used in the energy sector.			[SW1] Assessment of factual knowledge		

Subject contents	Course content – lecture Course content (lecture): <ul style="list-style-type: none"> • Building energy classification • Net-zero energy buildings standard • Technical systems based on renewable energy sources • Passive techniques for reducing energy demand • Active techniques for reducing energy demand • Heat accumulation methods 		
	Course content – project Course content (project): <ul style="list-style-type: none"> • Building energy demand modeling 		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Lecture exam	60.0%	50.0%
	Design of net-zero energy building	60.0%	50.0%
Recommended reading	Basic literature	Kowalczyk Z., (pod red.): Charakterystyka Energetyczna Budynków, Gdańsk, 2010. Mikoś J.: Budownictwo ekologiczne. Wydawnictwo Politechniki Śląskiej, Gliwice, 1996. Feist W., Munzenberg U, Thumulla J. Podstawy Budownictwa Pasywnego, 2009.	
	Supplementary literature	Klemm P.: Budownictwo Ogólne. Fizyka Budowli, Tom 2, Arkady Warszawa, 2006.	
	eResources addresses		
Example issues/ example questions/ tasks being completed	<ul style="list-style-type: none"> • Energy classification of buildings • Passive and active heating systems • Building energy performance • Technical systems based on renewable energy sources • Energy efficiency of available building solutions • Energy efficiency of the available technical systems 		
Practical activities within the subject	Not applicable		

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