GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Energy-efficient constructions, PG_00057253		
Field of study	Power Engineering		
Date of commencement of studies	February 2024	Academic year of realisation of subject	2023/2024
Education level	second-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	1	Language of instruction	Polish
Semester of study	1	ECTS credits	3.0
Learning profile	general academic profile	Assessment form	exam
Conducting unit	Department of Building Structures and Material Engineering -> Faculty of Civil and Environmental Engineering		
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Jarosław Florczuk	
	Teachers	dr inż. Jarosław Florczuk	

Lesson types and methods of instruction	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	10.0	35.0	75

Subject objectives	The aim of the course is to learn the passive and active techniques to reduce the building's energy demand and the methods of calculating the building's energy demand.

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[K7_U05] is able to integrate technical and economic analysis of the use of various energy technologies, including technologies using renewable energy sources and conventional and nuclear energy	The ability to analyze energy efficiency and economic analysis of available energy-saving building solutions.	[SU4] Assessment of ability to use methods and tools
	[K7_W02] has extended and deepened knowledge of physics, chemistry, thermodynamics, fluid mechanics, material science, necessary to understand and describe basic thermal and flow phenomena occurring in and around power equipment and systems, transmission networks and internal installations	The ability of building energy demand modeling.	[SW3] Assessment of knowledge contained in written work and projects
	[K7_W07] knows the environmental effects of energy technologies used; is familiar with the issues of effective energy management and use of renewable energy sources, has a broad and well-established knowledge of the processes of energy production and use	Ability to evaluate and select technical systems in terms of reducing the energy demand from non-renewable energy sources.	[SW3] Assessment of knowledge contained in written work and projects

Subject contents	Building energy classification.
	Passive techniques for reducing energy demand.
	Active techniques for reducing energy demand.
	Passive buildings.
	Energy+ buildings.
	Net zero energy buildings.
	Building energy demand modeling.
	Heat accumulation methods.

Prerequisites and co-requisites	

Assessment methods and criteria			
	Subject passing criteria	Passing threshold	Percentage of the final grade
	Design of energy-efficient building	60.0%	50.0%
	Lecture exam	60.0%	50.0%

Recommended reading	Basic literature	Kowalczuk 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	Adresy na platformie eNauczanie: Technologie budownictwa efektywnego energetycznie 2024 - Moodle ID: 38437 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=38437

Example issues/ example questions/ tasks being completed	Energy classification of buildings.
	Passive and active heating systems.
	Building energy performance.
	Energy efficiency of available building solutions.
	Energy efficiency of the available technical systems.

Work placement	Not applicable