



Subject card

Subject name and code	Intelligent Building, PG_00069111						
Field of study	BUDYNEK INTELIGENTNY						
Date of commencement of studies	October 2022		Academic year of realisation of subject		2025/2026		
Education level	first-cycle studies		Subject group				
Mode of study	Full-time studies		Mode of delivery		at the university		
Year of study	4		Language of instruction		Polish		
Semester of study	7		ECTS credits		4.0		
Learning profile	general academic profile		Assessment form		assessment		
Conducting unit	Department of Electrical Power Engineering -> Faculty of Electrical and Control Engineering -> Wydział Politechniki Gdańskiej						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Krzysztof Dobrzyński				
	Teachers		dr inż. Krzysztof Dobrzyński prof. dr hab. inż. Stanisław Czapp				
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	15.0	0.0	0.0	30
	E-learning hours included: 0.0						
	eNauczanie source address: https://enauczanie.pg.edu.pl/2025/course/view.php?id=793 Moodle ID: 793 BUDYNEK INTELIGENTNY [TWiE][2025/26] https://enauczanie.pg.edu.pl/2025/course/view.php?id=793						
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		0.0		0.0	30
Subject objectives	The aim of the course is to introduce students to the rules of designing multifunctional systems used in buildings that may feature energy storage facilities, renewable energy sources, and hydrogen installations. Students will learn the rules of designing and hardware verification of one of the leading smart building systems.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[K6_W18] knows the basics of the construction and operation of high-temperature fuel cells and electrolyzers powered by hydrogen and other fuels and their practical application for energy generation and storage	Knows the principles of creating power supply circuits for hydrogen systems and energy storage facilities.	[SW1] Ocena wiedzy faktograficznej
	[K6_W08] has basic knowledge in the field of energy storage systems: mechanical, thermal, electrical and others, knows the basics of thermodynamics and fluid mechanics, as well as the construction and operation of thermal energy equipment, hydrogen installations, process equipment, including renewable energy sources	Discusses the design and operation of selected energy storage systems, hydrogen installations, and renewable energy sources (RES) used in buildings.	[SW1] Ocena wiedzy faktograficznej
	[K6_W13] knows the properties of materials used in the field of hydrogen energy and electromobility	Directional effect inconsistent with the subject.	[SW1] Ocena wiedzy faktograficznej
	[K6_W15] he has knowledge of the construction, principles of operation and operation of electromagnetic energy converters used in transport systems and systems.	Directional effect inconsistent with the subject.	[SW1] Ocena wiedzy faktograficznej
	[K6_K02] can work in a group taking on different roles in it	Selected project tasks are carried out in groups.	[SK2] Ocena postępów pracy
	[K6_U12] can formulate a specification of simple engineering tasks of a practical nature related to the field of study	Implementation of the design process for electrical device power supply systems.	[SU1] Ocena realizacji zadania
	[K6_U08] can design and build systems and devices related to automation systems, mechatronics and robotics in energy storage devices and in hydrogen installations	Discusses the design and operation of selected energy storage systems, hydrogen installations, and renewable energy sources (RES) used in buildings.	[SU1] Ocena realizacji zadania
	[K6_U05] can use analytical and simulation methods, prepare and for the formulation and solution of tasks in the field of hydrogen technologies, automation and robotics, electrical engineering, use various techniques to carry out engineering tasks related to electrical devices, hydrogen installations, control and robotics systems	Designs power supply systems for electrical devices. Develops operating procedures for these systems and verifies their correctness.	[SU1] Ocena realizacji zadania
Subject contents	Tasks and structure of the electrical equipment control system. Main components of the system. Principles of communication between devices. Visualization of the smart building system operation. Possibilities of cooperation between smart building systems and electricity storage facilities, renewable energy sources, and hydrogen installations. Implementation, programming, and commissioning of a multifunctional smart building system. Verification of system errors.		
Prerequisites and co-requisites	No requirements.		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	zaliczenie praktyczne	60.0%	50.0%
	test	60.0%	50.0%

Recommended reading	Basic literature	1. Klajn A., Bielówka M.: Instalacja elektryczna w systemie KNX/EIB. Podręcznik INPE dla elektryków, zeszyt 10, czerwiec 2006 2. Petykiewicz P.: Nowoczesna instalacja elektryczna w inteligentnym budynku, COSiW, Warszawa 2001 3. Parol M., Rokicki Ł., Instalacje i systemy w inteligentnych budynkach. Laboratorium, OWPW, 2017 Warszawa 4. Duszczyk K., Dubrawski A., Dubrawski A., Pawlik, M., Szafrński M., Inteligentny budynek. Poradnik projektanta, instalatora i użytkownika, PWN, 2019, Warszawa 5. KNX Basic Course. Home and Building Management Systems, KNX Association 6. Project Engineering for EIB Installations. Basic Principles, 1998, EIBA srl
	Supplementary literature	1. EN 50090, Home and Building Electronic Systems (HBES) 2. ISO/IEC 14543-3, Information technology Home electronic systems (HES) architecturePart 3-10: Amplitude modulated wireless short-packet (AMWSP) protocol optimized for energy harvesting Architecture and lower layer protocols 3. EN 13321-1, Open data communication in building automation, controls and building management - Home and building electronic system - Part 1: Product and system requirements 4. EN 13321-2, Open Data Communication in Building Automation, Controls and Building Management - Home and Building Electronic Systems - Part 2: KNXnet/IP Communication
	eResources addresses	
Example issues/ example questions/ tasks being completed	In the laboratory, make, programming and start up the control installation of an electrical devices.	
Practical activities within the subject	Not applicable	

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