



## Subject card

Subject name and code	Intelligent Building, PG_00055964						
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			4.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	Department of Electrical Power Engineering -> Faculty of Electrical and Control Engineering						
Name and surname of lecturer (lecturers)	Subject supervisor	prof. dr hab. inż. Stanisław Czapp					
	Teachers						
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	30.0	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		49.0		100
Subject objectives	The achievement of knowledge and skills in the design and commissioning of intelligent electrical installations.						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	[K6_W03] knows the basics of automation and automatic regulation, knows the principles of the selection of electrical devices, drive systems and their control	Selects devices for KNX/EIB system and describes their operation.			[SW3] Assessment of knowledge contained in written work and projects		
	[K6_U05] is able to formulate and carry out energy balances in devices and energy systems, also perform an energy audit of a simple building object, is able to perform a preliminary profitability analysis of a planned energy investment	Operates expert ETS software.			[SU4] Assessment of ability to use methods and tools		
	[K6_U11] Can design and properly dimension basic foundations in hydrotechnical construction facilities; can evaluate and list the loads acting on constructions, knows the codes of modern geotechnical investigations and technologies, knows the principles of foundations and safe design of foundations of typical buildings	Performs the project of intelligent installation and starts this installation in laboratory condition.			[SU4] Assessment of ability to use methods and tools		
	[K6_W05] has structured knowledge in the field of electrical engineering and electronics, necessary to understand the basics of operation and selection of electrical machines, electricity transmission systems and power electronic devices	Student interprets topology of KNX/EIB system. Student describes the principles of design of electrical installations with KNX/EIB system.			[SW3] Assessment of knowledge contained in written work and projects		

Subject contents	<p>Definition of intelligent building. Types of control systems in buildings: KNX/EIB, LonWorks, VCN. European Installation Bus KNX/EIB system. The idea of the system, system elements, Sensors and actuators, graphical symbols. Topology. Devices, lines, areas. Physical address, group address. Communication in the KNX/EIB system. Data transmission, telegrams, flags, methods of the access to the bus. ETS software. Design and diagnostics. Design and performance of the KNX/EIB installation. Cables and devices. Overcurrent protection, protection against electric shock, protection against overvoltage. LABORATORY Introduction of ETS software, input data preparation. Principles project performance and starting the system. Electrical lighting switch on and switch off control. Advanced control of lighting (lighting illuminance control, time control). Windows shutter control. Temperature control. Automatic control of illuminance with presence sensor. Integration of systems for advanced topology. Visualization of the installation. Remote monitoring of the installation.</p>		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Practical exercise	50.0%	50.0%
	Test	50.0%	50.0%
Recommended reading	Basic literature	<p>1. Petykiewicz P.: Nowoczesna instalacja elektryczna w inteligentnym budynku. COSiW SEP 2001.</p> <p>2. Mikulik J.: Europejska Magistrała Instalacyjna EIB: rozproszony system sterowania bezpieczeństwem i komfortem. Stowarzyszenie Elektryków Polskich. Centralny Ośrodek Szkolenia i Wydawnictw, Warszawa 2008.</p>	
	Supplementary literature	Manual of devices of KNX/EIB system.	
	eResources addresses	Adresy na platformie eNauczanie:	
Example issues/ example questions/ tasks being completed	On a laboratory stand, performance of the installation for lighting control (using KNX system).		
Work placement	Not applicable		