



Subject card

Subject name and code	Intelligent electrical installations, PG_00059860						
Field of study	Automation, Robotics and Control Systems						
Date of commencement of studies	October 2022	Academic year of realisation of subject			2024/2025		
Education level	first-cycle studies	Subject group					
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		dr inż. Krzysztof Dobrzyński				
	Teachers		dr inż. Krzysztof Dobrzyński				
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	0.0	15.0	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	10.0		45.0	100	
Subject objectives	The purpose of the course is for the student to learn the principles of designing a low-voltage electrical system that works with the intelligent building system. The student will learn about the selection of cable cross-section and protection for lighting circuits that are controlled using KNX system actuators.						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	[K6_W07] has basic knowledge related to control and automation systems	Designs selected functionalities in a low-voltage intelligent electrical system.			[SW1] Assessment of factual knowledge		
	[K6_W06] knows the structure of computers and microprocessors and the tasks of operating systems, has basic knowledge of the basics of computer software, drivers, microprocessor technology, design of simple algorithms and the operation of information networks	Develops sample algorithms for the operation of intelligent low-voltage electrical systems.			[SW1] Assessment of factual knowledge		
	[K6_U04] has the ability to self-educate, among other things, in order to improve professional qualifications	Search for information useful in determining the scope of work of intelligent low-voltage electrical installations.			[SU1] Assessment of task fulfilment		
	[K6_K05] can think and act in an entrepreneurial way	Identify devices for implementing selected functionalities of intelligent electrical installations.			[SK5] Assessment of ability to solve problems that arise in practice		
	[K6_W11] knows the hazards arising from devices, installations, systems and technical systems, basic principles of occupational health and safety, taking into account the role of control and security systems in controlling automation and robotics facilities	He lists the rules for safe work with low-voltage equipment.			[SW1] Assessment of factual knowledge		

Subject contents	<p>LECTURE Low-voltage power grid systems. Power cables and wires. Protection in low-voltage installations. Protection against electric shock in low-voltage installations. Heating of wires and cables. Calculation of short-circuit currents in low-voltage installations. Selectivity of protections. The process of designing an low-voltage installations in conjunction with a building automation system.</p> <p>PROJECT Selection of cable cross-section and protection for a lighting circuit in a low-voltage electrical system controlled by a building automation system. Calculation of the power balance of a single-family building. Selection of cable cross-section and protection for distribution circuit. Calculation of short-circuit currents necessary in the design process of electrical installation. Evaluation of the effectiveness of electric shock protection.</p>											
Prerequisites and co-requisites	Fundamentals of electrical engineering.											
Assessment methods and criteria	<table border="1" data-bbox="448 434 1487 535"> <thead> <tr> <th data-bbox="448 434 798 468">Subject passing criteria</th> <th data-bbox="802 434 1139 468">Passing threshold</th> <th data-bbox="1144 434 1487 468">Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td data-bbox="448 474 798 501">Lecture colloquium</td> <td data-bbox="802 474 1139 501">60.0%</td> <td data-bbox="1144 474 1487 501">50.0%</td> </tr> <tr> <td data-bbox="448 508 798 535">Ocena z projektu</td> <td data-bbox="802 508 1139 535">60.0%</td> <td data-bbox="1144 508 1487 535">50.0%</td> </tr> </tbody> </table>			Subject passing criteria	Passing threshold	Percentage of the final grade	Lecture colloquium	60.0%	50.0%	Ocena z projektu	60.0%	50.0%
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Lecture colloquium	60.0%	50.0%										
Ocena z projektu	60.0%	50.0%										
Recommended reading	Basic literature	<ol style="list-style-type: none"> 1. H. Markiewicz: Instalacje elektryczne, WNT Warszawa 1996 (i późniejsze). 2. Poradnik inżyniera elektryka, WNT Warszawa 2011 (tom 3), 2007 (tom 2). 3. Musiał E.: Instalacje i urządzenia elektroenergetyczne. WSiP, Warszawa, 2008. 4. Budynek inteligentny Praca pod red. E. Niezabitowskiej WPS Gliwice 2014, Tom I, Tom II 5. Krzysztof Duszczyk i inni. Inteligentny budynek Poradnik projektanta, instalatora i użytkownika. PWN Warszawa 2019 6. Podstawowe systemy bezpieczeństwa w budynkach inteligentnych. WPS, Gliwice 2005 7. N SEP-E-002 Instalacje elektryczne w obiektach budowlanych. Instalacje elektryczne w obiektach mieszkalnych. Warszawa 2006. 										
	Supplementary literature	<ol style="list-style-type: none"> 1. P. Petykiewicz Nowoczesna instalacja elektryczna w inteligentnym budynku. COSIW Warszawa 2001. 2. Instalacje przeciwpożarowe - Edward Skiepmo (Zeszyty dla elektryków nr 5) Medium, 2010 3. PN-HD 60364-8-2: Instalacja elektryczna niskiego napięcia, Część 8-2: Niskonapięciowe instalacje elektryczne prosumenta 4. Parol M., Mikrosieci niskiego napięcia, Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa 2013 										
	eResources addresses	Adresy na platformie eNauczanie:										
Example issues/ example questions/ tasks being completed	Selection of wire cross-section and protection for an example lighting circuit in an installation cooperating with an intelligent building system.											
Work placement	Not applicable											

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