



## Subject card

Subject name and code	Electrical equipment and installations, PG_00042701						
Field of study	Environmental Engineering						
Date of commencement of studies	October 2020	Academic year of realisation of subject			2022/2023		
Education level	first-cycle studies	Subject group			Obligatory subject group in the field of study		
Mode of study	Part-time studies	Mode of delivery			at the university		
Year of study	3	Language of instruction			Polish		
Semester of study	6	ECTS credits			2.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	Department of Metrology and Information Systems -> Faculty of Electrical and Control Engineering						
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Ariel Dzwonkowski					
	Teachers	dr inż. Ariel Dzwonkowski					
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	0.0	0.0	0.0	15
	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	15		4.0		35.0	54
Subject objectives	The aim of the course is to provide students with basic knowledge of electrical devices and installations.						
Learning outcomes	Course outcome		Subject outcome			Method of verification	
	[K6_U01] has the ability to self-education, can obtain information from literature, databases and other sources, uses information technology, Internet resources; can integrate the obtained information, make their interpretation, as well as draw conclusions and formulate and justify opinions		Student classifies and distinguishes between DC and AC machines. The student defines the means of basic and additional protection against electric shock.				
	[K6_W11] has elementary knowledge of electrical devices and installations as well as basics of control and automation		The student defines and classifies the basic concepts of electrical engineering. Student solves simple DC and AC circuits.				
Subject contents	Lectures: Basic concepts of theoretical electrical engineering. Direct and alternating current. Ohm's law. Conductor resistance. Kirchhoff's laws. Calculation of the resultant resistance. Capacitors. Sinusoidal current. Power and energy in DC and AC circuits. Three-phase systems. Machines and electric drive. Types of electrical machines. Transformers. Idle, load and transformer short-circuits. Types of electrical machines. Direct current generators: separately-excited, shunt and series-shunt. DC motors: separately excited and series. Synchronous alternating current generators. Asynchronous AC motors. Nominal sizes of electric machines. Regulation and stabilisation of engine speed. Electrical Installations. Basic protection measures against electric shock. Additional protection against electric shock. Reset. Grounding and grounding. Residual current devices.						
Prerequisites and co-requisites	Basic knowledge of physics.						

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
		Lecture - written tests.	60.0%
Recommended reading	Basic literature	1. Miedziński B.: Elektrotechnika. Podstawy i instalacje elektryczne. Warszawa: PWN 2000.  2. Orlik W.: Egzamin kwalifikacyjny elektryka w pytaniach i odpowiedziach. Wydawnictwo KaBe 2006.	
	Supplementary literature	1. S. Bolkowski Teoria obwodów elektrycznych, WNT 2007.  2. M. Krakowski Elektrotechnika teoretyczna, PWN.	
	eResources addresses	Adresy na platformie eNauczanie:	
Example issues/ example questions/ tasks being completed	1. What is conductance?  2. What is impedance?  3. Introduce Ohm's law.  4. Discuss the characteristics of a separately excited DC motor.  5. Describe the construction of the ring electrical motor.  6. How does a residual current device work?  7. Present the layout of the TT network.  8. What is the additional protection against electric shock in LV networks?		
Work placement	Not applicable		