



Subject card

Subject name and code	Electrical equipment and installations, PG_00059151						
Field of study	Environmental Engineering						
Date of commencement of studies	October 2023	Academic year of realisation of subject			2023/2024		
Education level	first-cycle studies	Subject group			Obligatory subject group 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	2	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						
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	15.0	0.0	0.0	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	5.0		20.0		55
Subject objectives	The aim of the course is to provide students with basic knowledge in the field 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	The student classifies and distinguishes DC and AC machines. The student defines the means of basic and additional protection against electric shock.			[SU2] Assessment of ability to analyse information		
	[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. The student solves simple DC and AC circuits.			[SW1] Assessment of factual knowledge		
Subject contents	<p>Lectures: Basic concepts of theoretical electrical engineering. Direct and alternating current. Ohm's law. Conductor resistance. Kirchhoff's laws. Calculation of resultant resistance. Capacitors. Sinusoidal current. Power and energy in DC and AC circuits. Three-phase systems. Machines and electric drive. Types of electric machines. Transformers. No-load condition, loads and short circuits of the transformer. Types of electric machines. Direct current generators: separately excited, shunt and series-shunt. DC motors: separately excited and series. Alternating current synchronous generators. AC asynchronous motors. Nominal sizes of electrical machines. Regulation and stabilization of motor speed. Electrical Installations. Means of basic protection against electric shock. Additional shock protection. Reset. Earthings and earthings. RCDs.</p> <p>Exercises: DC and AC current. Ohm's law. Conductor resistance. Kirchhoff's laws. Calculation of resultant resistance. Capacitors. Sinusoidal current. Power in DC and AC circuits.</p>						
Prerequisites and co-requisites	Knowledge of operations with complex numbers. Basic knowledge of physics.						

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Lecture - written tests.	60.0%	50.0%
	Exercises - written tests.	60.0%	50.0%
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: Urządzenie i Instalacje Elektryczne 23/24 sem.2 - Moodle ID: 36686 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=36686	
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 a ring 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		