GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Protection against electric shock, PG_00061797		
Field of study	Automation, Robotics and Control Systems		
Date of commencement of studies	October 2020	Academic year of realisation of subject	2023/2024
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	3.0
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	15.0	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	40.0	75

Subject objectives

Gaining knowledge about the risk of electric shock and means of protection against electric shock

Learning outcomes

Course outcome	Subject outcome	Method of verification
[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	The student knows the specificity of electronic devices, including computer devices, and their impact on the safety of the operators.	[SW3] Assessment of knowledge contained in written work and projects
[K6_U01] can obtain information from literature, databases and other sources; integrate the information obtained, interpret it and draw conclusions, formulate and justify opinions	The student is able to use the literature, including standards relating to protection against electric shock.	[SU4] Assessment of ability to use methods and tools
[K6_U03] can prepare and present a presentation on the problems and results of an engineering task	The student is able to prepare a multimedia presentation and present the results obtained in the implementation of the task engineering.	[SU5] Assessment of ability to present the results of task [SU2] Assessment of ability to analyse information

Subject contents

Electric shock. Effects of current on human beings and livestock, threshold of perception, of let-go, of ventricular fibrillation. Electrical impedance of the human body. Touch voltage and body current. Earthing. Earth electrodes, soil resistivity, earthing resistance. Earthing resistance calculation. Protection in low-voltage installations: basic protection, fault protection, additional protection. Residual current devices. Protection in high-voltage installations. Earthing system for HV installations. Measuring of touch voltages. LABORATORY: Laboratory model for the demonstration of means of protection against electric shock. Earthing in LV systems. Conductivity of floor and wall testing. Effectiveness of protection against electric shock testing in installations with RCDs. Earth loop impedance measurement. Earthing electrode resistance measurement. Conductivity of soil measurement. Insulation resistance measurement.

Prerequisites and co-requisites

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Laboratory tasks	100.0%	50.0%
Test	50.0%	50.0%

Recommended reading	Basic literature	1. Czapp S.: Ochrona przeciwporażeniowa w sieciach i instalacjach niskiego napięcia. PWN, Warszawa 2023. 2. Markiewicz H.: Bezpieczeństwo w elektroenergetyce. WNT, Warszawa 2017.
	Supplementary literature	Musiał E.: Instalacje i urządzenia elektroenergetyczne, WSP, Warszawa 2008.
	eResources addresses	Adresy na platformie eNauczanie:
Example issues/ example questions/ tasks being completed	1. It is assumed that the threshold of let-go is (for 50 Hz): a) 1 mA b) 10 mA c) 30 mA 2. A-type residual current devices detect: a) alternating earth fault current and pulsating direct earth fault current b) only alternating earth fault current c) only pulsating direct earth fault current	
Work placement	Not applicable	