GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Protection against electrical hazards, PG_00059859		
Field of study	OCHRONA PRZED ZAGROŻENIAMI ELEKTRYCZNYMI		
Date of commencement of studies	October 2023	Academic year of realisation of subject	2025/2026
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 -> Faculties of Gdańsk University of Technology		
Name and surname of lecturer (lecturers)	Subject supervisor	prof. dr hab. inż. Stanisław Czapp	
	Teachers		

Lesson types

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	30.0	0.0	15.0	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	10.0	45.0	100

Subject objectives

Knowledge of main electrical hazards and principles of protection against them.

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	Defines the specificis of computer installations and microprocessors, as well as the electrical hazards associated with them.	[SW1] Ocena wiedzy faktograficznej
[K6_W07] has basic knowledge related to control and automation systems	Defines safety principles in control and automation systems.	[SW1] Ocena wiedzy faktograficznej
[K6_K05] can think and act in an entrepreneurial way	Plans and performs electrical measurements related to the assessment of the condition of selected electrical installations	[SK5] Ocena umiejętności rozwiązywania problemów występujących w praktyce
[K6_U04] has the ability to self-educate, among other things, in order to improve professional qualifications	Uses regulations regarding protection against electric shock..	[SU3] Ocena umiejętności wykorzystania wiedzy uzyskanej w ramach przedmiotu
[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	Explains effects of current on human beings. Specifies and explains the means of protection against electric shock in LV systems and HV systems.	[SW3] Ocena wiedzy zawartej w opracowaniu tekstowym i projektowym

<table>
<tr><td>Subject contents</td><td>Course content – lecture
Occupational risk assessment. Electric shocks. 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 and their measurement. Earthing resistance calculation. Protection in low-voltage installations. Protection in high-voltage installations. Earth fault current calculation. Residual current devices. Measuring of touch voltages. Other hazards. Sources of hazards and protection. Work ergonomics and hygiene. LABORATORY Laboratory model for demonstration of means of protection against electric shock. Earthing in low-voltage 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.</td></tr>
<tr><td>Prerequisites and co-requisites</td><td></td></tr>
<tr><td>Assessment methods and criteria</td><td>
<table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>Test</td><td>50.0%</td><td>67.0%</td></tr>
<tr><td>Laboratory - report</td><td>100.0%</td><td>33.0%</td></tr>
</table>
</td></tr>
<tr><td>Recommended reading</td><td>
<table>
<tr><td>Basic literature</td><td>1. Czapp S.: Ochrona przeciwporażeniowa w sieciach i instalacjach niskiego napięcia. PWN, Warszawa 2023.

2. Markiewicz H.: Bezpieczeństwo w elektroenergetyce. WNT, Warszawa, 2017.</td></tr>
<tr><td>Supplementary literature</td><td>1. Musiał E.: Instalacje i urządzenia elektroenergetyczne, WSP, Warszawa, 2008.</td></tr>
<tr><td>eResources addresses</td><td></td></tr>
</table>
</td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td>1. Threshold of perception for 50 Hz sinusoidal current is:

a) 0,05 mA

b) 0,5 mA

c) 5 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</td></tr>
<tr><td>Practical activites within the subject</td><td>Not applicable</td></tr>
</table>

Document generated electronically. Does not require a seal or signature.