GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Protection against Electrical Hazards, PG_00042167		
Field of study	Power Engineering, Power Engineering, Power Engineering, Power Engineering, Power Engineering		
Date of commencement of studies	October 2020	Academic year of realisation of subject	2023/2024
Education level	first-cycle studies	Subject group	Optional subject group Subject group related to scientific research in the field of study
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	exam
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	3.0	42.0	75

Subject objectives

To achieve ability of designing and maintenance of electrical devices (in basic level).

Learning outcomes

Course outcome	Subject outcome	Method of verification
K6_U04	The student is able to select the means of protection against electric shock to the low-voltage system and to the high-voltage system.	[SU4] Assessment of ability to use methods and tools
K6_W05	Student knows the principles of applying the protection devices and rescue of people.	[SW2] Assessment of knowledge contained in presentation
K6_U03	Student knows and apply the principles of ergonomics, safety and hygiene at work.	[SU1] Assessment of task fulfilment

Subject contents

Electric risk. Health and safety management systems. 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 case of fault, additional protection. Protection in high voltage installations. Earthing system for HV installations. Measuring touch voltages. Other hazards. Sources of hazards and protection. Work ergonomics and hygiene.

Prerequisites and co-requisites

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Written exam	50.0%	100.0%

<table>
<tr><td rowspan="3">Recommended reading</td><td>Basic literature</td><td>1. Czapp S.: Ochrona przeciwporażeniowa w sieciach i instalacjach niskiego napięcia. PWN, Warszawa 2023.

2. Jabłoński W.: Ochrona przeciwporażeniowa w urządzeniach elektroenergetycznych niskiego i wysokiego napięcia. WNT, Warszawa 2005.

3. Markiewicz H.: Bezpieczeństwo w elektroenergetyce. WNT, Warszawa 2009.</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>Adresy na platformie eNauczanie:</td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td colspan="2">1. Threshold of let-go for 50 Hz sinusoidal current is:

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

3. Permissible earth potential rise for long duration of current flow in 110/15 kV substation is:

a) 80 V

b) 160 V

c) 50 V</td></tr>
<tr><td>Work placement</td><td colspan="2">Not applicable</td></tr>
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