GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Electrical equipment and installations, PG_00059151		
Field of study	Environmental Engineering		
Date of commencement of studies	October 2026	Academic year of realisation of subject	2026/2027
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	Partment of Metrology and Information Systems -> Faculty of Electrical and Control Engineering -> Faculties of Gdańsk University of Technology		
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Ariel Dzwonkowski	
	Teachers		

Lesson types

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_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
[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

Subject contents

Course content – lecture
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.

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.

Prerequisites and co-requisites

Knowledge of operations with complex numbers. Basic knowledge of physics.

<table>
<tr><td>Assessment methods and criteria</td><td colspan="3"><table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>Exercises - written tests.</td><td>60.0%</td><td>50.0%</td></tr>
<tr><td>Lecture - written tests.</td><td>60.0%</td><td>50.0%</td></tr>
</table></td></tr>
<tr><td rowspan="3">Recommended reading</td><td>Basic literature</td><td colspan="2">1. Miedziński B.: Elektrotechnika. Podstawy i instalacje elektryczne. Warszawa: PWN 2000.2. Orlik W.: Egzamin kwalifikacyjny elektryka w pytaniach i odpowiedziach. Wydawnictwo KaBe 2006.</td></tr>
<tr><td>Supplementary literature</td><td colspan="2">1. S. Bolkowski Teoria obwodów elektrycznych, WNT 2007.2. M. Krakowski Elektrotechnika teoretyczna, PWN.</td></tr>
<tr><td>eResources addresses</td><td colspan="2"></td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td colspan="3">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?</td></tr>
<tr><td>Practical activites within the subject</td><td colspan="3">Not applicable</td></tr>
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