



## Subject card

Subject name and code	Electronics and electrical engineering, PG_00061903						
Field of study	Materials Engineering						
Date of commencement of studies	October 2023	Academic year of realisation of subject			2024/2025		
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	2	Language of instruction			Polish		
Semester of study	3	ECTS credits			5.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	Department of Electrochemistry, Corrosion and Materials Engineering -> Faculty of Chemistry						
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Krzysztof Żakowski					
	Teachers	dr hab. inż. Krzysztof Żakowski					
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	30.0	0.0	0.0	60
	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	60		5.0		60.0	125
Subject objectives	The student will master the basics of electrical engineering to the extent of understanding the generation, transmission and distribution of electricity and the principle of operation of selected electrical machines. The acquired knowledge will be useful in the further course of studies, in future professional work and in everyday life when using modern electrical and electronic devices.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[K6_U03] Can critically analyze and evaluate the functioning – particularly in the context of materials engineering –existing technical solutions, particularly equipment, objects, systems, processes.	The student is able to evaluate the functioning of basic electrical engineering equipment.	[SU2] Assessment of ability to analyse information
	[K6_W05] Has the knowledge of mechanics, technology and electrical engineering, including engineering graphics and using computer aid, the use of databases in the design of technological processes.	The student knows the construction and application of basic electrical engineering equipment.	[SW3] Assessment of knowledge contained in written work and projects
	[K6_U06] Can integrate obtained information, interpret it and draw conclusions, as well as formulate and justify opinions.	The student is able to interpret measurement data on basic electrical engineering circuits and systems.	[SU2] Assessment of ability to analyse information
	[K6_K01] Understands the need to improve professional and personal competencies; is conscious of own limitations and knows when to turn to experts, properly establishes priorities helping to accomplish tasks defined by oneself or others.	The student understands the need to improve professional skills.	[SK5] Assessment of ability to solve problems that arise in practice
[K6_U01] Can properly use selected analytical, simulation and experimental methods, as well as devices for measuring the fundamental properties of materials and technological processes.	The student is able to measure electrical quantities.	[SU4] Assessment of ability to use methods and tools	
Subject contents	<p>Lectures:</p> <ul style="list-style-type: none"> <li>• Direct current electrical circuits</li> <li>• Alternating current electrical circuits</li> <li>• Three-phase systems, connection of consumers in star and delta</li> <li>• Electrical machines</li> <li>• Electric power system, generation, transmission and distribution of electricity</li> <li>• Electrical network systems and installations</li> <li>• Basic electronic components and circuits</li> </ul> <p>Labs:</p> <ul style="list-style-type: none"> <li>• Multimeters</li> <li>• Resistance measurements</li> <li>• Measurements of resistance to grounding</li> <li>• Diode and rectifiers</li> <li>• Operational amplifier</li> <li>• Prototype circuits</li> <li>• Residential electrical installations</li> </ul>		
Prerequisites and co-requisites	General electrical engineering knowledge. Fundamentals of physics.		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	laboratory	100.0%	50.0%
	colloquium	60.0%	50.0%
Recommended reading	Basic literature	not applicable	
	Supplementary literature	not applicable	
	eResources addresses	Adresy na platformie eNauczanie: Elektrotechnika i elektronika - IM 2024/25 - Moodle ID: 28076 <a href="https://enauzanie.pg.edu.pl/moodle/course/view.php?id=28076">https://enauzanie.pg.edu.pl/moodle/course/view.php?id=28076</a>	

<p>Example issues/ example questions/ tasks being completed</p>	<p>Lectures:</p> <ul style="list-style-type: none"> <li>• Connection of three-phase consumers in star and delta.</li> <li>• Commutator machines.</li> <li>• Induction motors.</li> <li>• TN-S, TN-C-S network systems.</li> <li>• Diodes, transistors, thyristors.</li> </ul> <p>Labs:</p> <ul style="list-style-type: none"> <li>• Determination of the equivalent resistance of a circuit.</li> <li>• Determination of voltage-current characteristics of a diode.</li> <li>• Design and assembly of a prototype circuit with a temperature sensor.</li> <li>• Performing the design of an electrical system in an apartment.</li> </ul>
<p>Work placement</p>	<p>Not applicable</p>

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