GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Electronics and Electrical Engineering, PG_00060455		
Field of study	Mechanical and Naval 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	Part-time studies	Mode of delivery	at the university
Year of study	1	Language of instruction	Polish
Semester of study	2	ECTS credits	4.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Division of Marine Auxiliary Machinery -> Institute of Naval Architecture -> Faculty of Mechanical Engineering and Ship Technology -> Faculties of Gdańsk University of Technology		
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Wojciech Leśniewski	
	Teachers		

Lesson types

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	18.0	18.0	9.0	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	6.0	49.0	100

Subject objectives

The aim of the course is to familiarize students with basic issues related to electrical engineering and industrial electronics. The subject will also cover aspects related to the automation of ocean engineering systems and devices.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_W02] possesses an organized knowledge on physics, including classic mechanics, electricity and magnetism, shows knowledge of the elements of thermodynamics	The student knows and understands the laws of physics accompanying the transformation and transmission of electricity in electrical devices used in industry.	[SW2] Assessment of knowledge contained in presentation
[K6_W10] possesses knowledge on electronics and electrical engineering	The student is able to know and understand the role of power electronics in modern control and automation systems.	[SW1] Assessment of factual knowledge
[K6_U05] is able to plant an experiment within the range of measuring the basic operating parameters of mechanical devices using a specialized equipment, interpret the results and reach the correct conclusions	The student knows and is able to use basic knowledge of electrical engineering to assess the correct operation of power electronic devices used, among others, in ship technology.	[SU2] Assessment of ability to analyse information

<table>
<tr><td>Subject contents</td><td>Course content – lecture
Lecture:

1. Electric current 2. Sources of electric energy 3. Electric current circuits 4. Magnetic field and electromagnetism 5. Sinusoidal current circuits. 6. Power in alternating current circuits 6. Selected elements of electronic systems 7. Semiconductor elements 8. Rectifiers and control systems used in power electronics 9. Amplifiers and generators 10. Digital circuits 11. Measurements of non-electrical quantities used in industry 12. Programmable logic systems 13. Transmission of non-electric signals over a distance 14.Radio technology in industrial applications.

Exercises:

1. Electric current in conductors 2. Ohm's law 3. Power and energy of electric current. 4. Series and parallel connection of electronic components 5. Sources of electrical energy 6. Electric field 7. Magnetic field 8. AC circuits 9. Power in AC circuits 10. Three-phase systems 11. Transmission of electrical energy over a distance.

Lab:

1. Measurements of electrical quantities 2. Ohm's law 3. Power and energy of electric current. 4. Series and parallel connection of electronic components 5. Sources of electricity</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>kolokwium (2 w semstrze)</td><td>60.0%</td><td>60.0%</td></tr>
<tr><td>kolokwium</td><td>60.0%</td><td>30.0%</td></tr>
<tr><td>zaliczenie na podstawie sprawozdań</td><td>100.0%</td><td>10.0%</td></tr>
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<tr><td>Recommended reading</td><td>
<table>
<tr><td>Basic literature</td><td>1. Sztuka elektroniki. Tom 1-2, Horowitz Paul, Hill Winfield, Wydawnictwa Komunikacji i Łączności WKŁ

2. Elektronika bez oporu. Praktyczne przykłady. Witold Wrotek. Wydawnictwo Helion</td></tr>
<tr><td>Supplementary literature</td><td>1.Wprowadzenie do elektrotechniki i elektroniki. TOM 1-4. Allan R. Hambley. Wydawnictwo Naukowe PWN 2. Arduino. 36 projektów dla pasjonatów elektroniki. Simon Monk. Wydawnictwo Helion</td></tr>
<tr><td>eResources addresses</td><td></td></tr>
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<tr><td>Example issues/ example questions/ tasks being completed</td><td>Jak wyżej.</td></tr>
<tr><td>Practical activites within the subject</td><td>Not applicable</td></tr>
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