



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 2024		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	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	Zakład Wyposażenia Okrętu -> Institute of Ocean Engineering and Ship Technology -> Faculty of Mechanical Engineering and Ship Technology						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Wojciech Leśniewski				
	Teachers						
Lesson types and methods of instruction	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		

Subject contents	<p>Lecture:</p> <p>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.</p> <p>Exercises:</p> <p>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.</p> <p>Lab:</p> <p>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</p>		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	kolokwium (2 w semestrze)	60.0%	60.0%
	kolokwium	60.0%	30.0%
	zaliczenie na podstawie sprawozdań	100.0%	10.0%
Recommended reading	Basic literature	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	
	Supplementary literature	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	
	eResources addresses	Adresy na platformie eNauczanie:	
Example issues/ example questions/ tasks being completed	Jak wyżej.		
Work placement	Not applicable		