

。 GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Electronics and electrotechnics, PG_00060844								
Field of study	Chemical Technology	Chemical Technology							
Date of commencement of studies	October 2025		Academic year of realisation of subject			2025/2	2025/2026		
Education level	first-cycle studies		Subject gro	Subject group			Obligatory subject group in the field of study		
Mode of study	Full-time studies	Full-time studies		Mode of delivery			at the university		
Year of study	1	1		Language of instruction					
Semester of study	2		ECTS cred	ECTS credits					
Learning profile	general academic profile		Assessmer	Assessment form			assessment		
Conducting unit	Department of Physical Chemistry -> Faculty of Chemistry -> Wydziały Politechniki Gdańskiej								
Name and surname	Subject supervisor	Subject supervisor dr hab. inż. Jarosław Wawer							
of lecturer (lecturers)	Teachers								
Lesson types and methods	Lesson type	Lecture	Tutorial	Laboratory	Projec	.t	Seminar	SUM	
of instruction	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		2.0		18.0		50	
Subject objectives	The purpose of the course is to prepare non-electronic engineers to work with specialists in the field. This need arises from the increasing unification of science and technology. Apparatus used in chemical technology and biotechnology, in addition to the use of physical and chemical phenomena, requires basic knowledge of the operation of electronic systems. The combination of all the above-mentioned disciplines will allow conscious planning of work and analysis of chemical and biological samples. The content of the course also addresses practical issues regarding the use of electricity.								
Learning outcomes	Course out	come Subject outcome				Method of verification			

Subject contents	The course content has been designed to help students make better use of their knowledge from other fields upon completing this course. Particular emphasis is placed on the practical aspect, enabling future work not only in biological and chemical laboratories but also in positions closely related to industrial production. The primary teaching method will involve using fundamental mathematical and physics concepts to analyze measurement results. Course Outline: • Basic concepts hydraulic analogy of an electrical circuit • Ohms law, internal resistance of a power source • How to read and draw electrical schematics? • Mains voltage, three-phase current • Work, power, effective power • Basic electronic components resistors, symbols, and key parameters • Kirchhoffs first and second laws • Capacitors technical parameters • Kirchhoffs first and second laws • Capacitors in integrating and differentiating circuits • Diodes semiconductor circuit design • Types of diodes (rectifier diodes, Zener diodes, LEDs, RGB) • Half-wave and full-wave rectifiers, Graetz bridge • Voltage regulators (structure, characteristics, operating states, circuits) • Diperational amplifiers (example applications) • Diperational amplifiers (example applications) • Diperational amplifiers (example applications) • Diperature measurement and control • DC motors and generators, AC motors • Power regulators • Electrical energy transmission Laboratory Sessions: During the laboratory classes, students work with Raspberry Pi Pico microcontrollers. They connect them to computers, program in MicroPython , and build simple circuits. The lab sessions include five meetings covering: 1 Basic principles of electronic circuit design					
Prerequisites	Bluetooth protocol management with MCU Sepper motor control Basic knowledge of mathematics and physics.					
and co-requisites	1					
Assessment methods	Subject passing criteria	Passing threshold	Percentage of the final grade			
		50.0%	60.0%			
Recommended reading	L Basic literature	1) Paul Horowitz, Winfield Hill, Sztuka elektroniki cz. 1-2, Wydawnictwo WKŁ, Warszawa 2013				
	 2) Paweł Hempowicz, "Elektrotechnika i elektronika dla ni Wydawnictwo WNT, Warszawa, 1999 3) Miesiecznik Elektronika dla Wezyetkich, Wudawnictwa 		nika i elektronika dla nieelektryków", 99 vstkich Wydawnictwo AVT			
	Supplementary literature	1) Cathleen Shamieh, Elektronika dla bystrzaków., Septem, Gliwice				
		2017				
Example issues/	exesources addresses					
example questions/ tasks being completed						
Work placement	Not applicable					

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