



Subject card

Subject name and code	Electronics, PG_00038435						
Field of study	Electrical Engineering						
Date of commencement of studies	October 2023		Academic year of realisation of subject		2024/2025		
Education level	first-cycle studies		Subject group				
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		exam		
Conducting unit	Department of Power Electronics and Electrical Machines -> Faculty of Electrical and Control Engineering						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. inż. Marek Turzyński				
	Teachers		dr hab. inż. Marek Turzyński				
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		8.0		57.0	125
Subject objectives	Knowledge and analysis of fundamental electronic components and applications.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	K6_W04		Student is able to explain and knows physical mechanisms of phenomena occurring in semiconductor materials.		[SW3] Assessment of knowledge contained in written work and projects [SW1] Assessment of factual knowledge		
	K6_W05		Student is able to perform tasks and laboratory measurements.		[SW3] Assessment of knowledge contained in written work and projects [SW1] Assessment of factual knowledge		
	K6_U08		Student knows operation principles of elements and elementary electronic circuits. Student is able to define functions of electronic system and can design a simple electronic circuit.		[SU4] Assessment of ability to use methods and tools [SU3] Assessment of ability to use knowledge gained from the subject		
	K6_K05		Student knows electrical safety rules of using electronic equipment.		[SK5] Assessment of ability to solve problems that arise in practice		
Subject contents	Laboratory equipment: multimeters, oscilloscopes, measuring probes. Passive electronic components: resistors, capacitors, inductors. Semiconductors: conduction processes, doped semiconductors, pn junction, ms junction. Diodes: switching, rectifier, Schottky, Zener, photodiodes, light emitting diodes, solar panels. Transistors bipolar and unipolar: structure, operation principles, electrical data and characteristics. Optoelectronic components. Amplifiers: technical data, characteristics, influence of negative feedback. Differential and operational amplifiers. Filters. Power amplifiers. Generators. Power supply units. Phase lock loop. Digital circuit technologies. A/C and D/C converters.						
Prerequisites and co-requisites	Fundamentals of physics. Basic circuit theory.						
Assessment methods and criteria	Subject passing criteria		Passing threshold		Percentage of the final grade		
	Written test		50.0%		50.0%		
	Practical exercises		50.0%		50.0%		

Recommended reading	Basic literature	<ol style="list-style-type: none"> 1. Opolski A.: Elektronika dla elektryków. Wydawnictwo PG, Biblioteka Cyfrowa PG, 2008. 2. Opolski A. (red.): Elektronika dla elektryków - Laboratorium. Wydawnictwo PG. Gdańsk 2000.
	Supplementary literature	<ol style="list-style-type: none"> 1. Hennel J.: Podstawy elektroniki półprzewodnikowej. WNT Warszawa 2003. 2. Boksa J.: Analogowe układy elektroniczne. Wydawnictwo BTC Warszawa 2007. 3. Filipkowski A.: Układy elektroniczne analogowe i cyfrowe. WNT Warszawa 2006.
	eResources addresses	Adresy na platformie eNauczanie:
Example issues/ example questions/ tasks being completed	Field-effect transistors: structure, classification, graphic symbols and current-voltage output characteristics	
Work placement	Not applicable	