GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Electronics, PG_00038074
Field of study	Automation, Robotics and Control Systems

Date of commencement of studies	October 2022	Academic year of realisation of subject	2022/2023
Education level	first-cycle studies	Subject group	
Mode of study	Full-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	exam

Conducting unit	Department Of Power Electronics And Electrical Machines -> Faculty Of Electrical And Control Engineering -> Wydziały Politechniki Gdańskiej

Name and surname of lecturer (lecturers)	Subject supervisor	prof. dr hab. inż. Piotr Chrzan
	Teachers	prof. dr hab. inż. Piotr Chrzan
		dr hab. inż. Marek Turzyński
		dr hab. inż. Piotr Musznicki
		dr inż. Krzysztof Iwan

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	35.0	100

Subject objectives	Acquisition of knowledge on fundamental electronic components, circuits and equipment in order to learn a wise application of electronics in control engineering.

Learning outcomes	Course outcome	Subject outcome	Method of verification
	K6_W05		
	K6_U08		
	[K6_K05] can think and act in an entrepreneurial way		
	[K6_W05] has basic knowledge of the principles of operation of basic electronic, energy and power electronic components and systems		
	[K6_W04] has basic knowledge of methods of analysis of direct and alternating current circuits		
	K6_W04		
	K6_K05		
	[K6_U08] can design and build systems and devices in the field related to mechatronics and robotics systems		

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
	practical exercise	50.0%	50.0%
	written exam	50.0%	50.0%

Recommended reading	Basic literature	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	1. Boksa J.: Analogowe układy elektroniczne. Wydawnictwo BTC Warszawa 2007. 2. Filipkowski A.: Układy elektroniczne analogowe i cyfrowe. WNT Warszawa 2006.
	eResources addresses	Uzupełniające Adresy na platformie eNauczanie:

Example issues/ example questions/ tasks being completed	Describe schemes and frequency responses of integrator and differentiator based on operational amplifiers.
Work placement	Not applicable

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