

。 GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Interferences in the operation of automation and control systems, PG_00059861									
Field of study	Automation, Robotics and Control Systems									
Date of commencement of studies	October 2022		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	3		Language of instruction			Polish				
Semester of study	6		ECTS credits			4.0				
Learning profile	general academic profile		Assessment form			assessment				
Conducting unit	Department of Power Electronics and Electrical Machines -> Faculty of Electrical and Control Engine						Engineering			
Name and surname	Subject supervisor	ubject supervisor dr hab. inż. Jarosław Łuszcz								
of lecturer (lecturers)	Teachers	eachers								
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Projec	t	Seminar	SUM		
	Number of study hours	30.0	0.0	15.0	0.0) 0.0		45		
	E-learning hours included: 0.0									
Learning activity and number of study hours	Learning activity	Participation in classes includ plan	n didactic ed in study	Participation in consultation hours		Self-study		SUM		
	Number of study 45 hours			10.0		45.0		100		
Subject objectives	Discussion of the causes of device interference in control systems.									
Learning outcomes	Course outcome		Subject outcome			Method of verification				
	[K6_U04] has the ability to self- educate, among other things, in order to improve professional qualifications		The student is able to self-educate			[SU2] Assessment of ability to analyse information				
	[K6_K05] can think and act in an entrepreneurial way		The student knows the principles of entrepreneurship			[SK3] Assessment of ability to organize work				
	[K6_W07] has basic knowledge related to control and automation systems		The student has knowledge related to disturbances in control and automation systems			[SW1] Assessment of factual knowledge				
	[K6_W06] knows the structure of computers and microprocessors and the tasks of operating systems, has basic knowledge of the basics of computer software, drivers, microprocessor technology, design of simple algorithms and the operation of information networks		The student has knowledge related to interference in computer systems			[SW1] Assessment of factual knowledge				
	[K6_W11] knows the hazards arising from devices, installations, systems and technical systems, basic principles of occupational health and safety, taking into account the role of control and security systems in controlling automation and robotics facilities		The student knows the threats arising from devices and installations			[SW1] Assessment of factual knowledge				
Subject contents	 Explanation of the causes of interference with the operation of electronic devices. Sources, types and propagation paths of electromagnetic disturbances. Typical examples of mutual interference of electronic devices. Methods to reduce disturbances in selected control systems. Elements of designing electronic circuits with increased immunity to interference. Engineering testing of equipment immunity to interference. Laboratory demonstrations of interference elimination examples. 									

Prerequisites and co-requisites					
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade		
	Laboratory reports	50.0%	50.0%		
	Active participation in the lecture	50.0%	50.0%		
Recommended reading	Basic literature	. Spiralski L., Kołodziejski J., Konczakowska A., Hasse L. Zakłócenia w aparaturze elektronicznej. Radioelektronik Sp. z o.o. Warszawa 1995. 2. Charoy A. Zakłócenia w urządzeniach elektronicznych. Warszawa: WNT, 2000.			
	Supplementary literature	Howard W. Johnson, Martin Graham: High-speed Signal Propagation: Advanced Black Magic. Prentice Hall Professional, 2003.			
	eResources addresses	Podstawowe			
		https://www.emcstandards.co.uk/emcacademy - A website presenting the range of issues related to the electromagnetic compatibility of electrical devices. Active participation in the lecture Adresy na platformie eNauczanie:			
Example issues/ example questions/ tasks being completed	Checking the immunity of selected electronic devices to electromagnetic disturbances.				
Work placement	Not applicable				

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