GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Electromagnetic Interference in Printed Circuit Boards, PG_00036795						
Field of study	Automation, Robotics and Control Systems						
Date of commencement of studies	February 2024		Academic year of realisation of subject		2024/2025		
Education level	second-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		2.0		
Learning profile	general academic profile		Assessment form		assessment		
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. Jarosław Łuszcz				
	Teachers						

Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	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	8.0	12.0	50

Subject objectives	The aim of the course is to provide knowledge about the causes of electromagnetic interference in printed circuits and methods of reducing it.

Learning outcomes	Course outcome	Subject outcome	Method of verification
	K7_U07	selects simulation tools for the analysis of electromagnetic disturbances in printed circuits.	[SU4] Assessment of ability to use methods and tools
	K7_W11	selects simulation tools for the analysis of electromagnetic disturbances in printed circuits.	[SW1] Assessment of factual knowledge
	K7_U04	applies specialist knowledge	[SU3] Assessment of ability to use knowledge gained from the subject
	K7_W06	applies knowledge of EMC requirements when designing printed circuit boards.	[SW1] Assessment of factual knowledge
	K7_U03	presents the results of engineering research.	[SU5] Assessment of ability to present the results of task

Subject contents	LECTURE Sources and propagation of conducted and radiated electromagnetic disturbances. Electromagnetic emission and immunity of electrical devices. Typical causes of interference in printed circuits. Selected methods of reducing electromagnetic interference in printed circuits. LABORATORY Measurements of conducted and radiated electromagnetic disturbance levels. Testing the immunity of devices to electromagnetic interference. Presentation of the effectiveness of selected methods of reducing interference in printed circuits.

Prerequisites and co-requisites	

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Midterm colloquium	50.0%	100.0%

Recommended reading	Basic literature	Charoy, Alain i in. Kompatybilność elektromagnetyczna: Zakłócenia w urządzeniach elektronicznych. Tom 1, 2, 3 i 4. Warszawa: Wydawnictwa Naukowo-Techniczne, 1999. L. Hasse, J. Kołodziejski, Z. Karkowski, A. Konczakowska, L. Spiralski: Zakłócenia w aparaturze elektronicznej. Warszawa: "Radioelektronik ", 1995.

	Supplementary literature	Ott, Henry W. Electromagnetic Compatibility Engineering. Rev. ed. Hoboken, N.J: John Wiley & Sons, 2009. Bogatin, Eric. *Signal and Power Integrity Simplified*. 2nd ed. Pearson Prentice Hall, 2009. Bogatin, Eric. *Bogatins Practical Guide to Prototype Breadboard and PCB Design*. 1st ed. Norwood, MA: Artech House, 2022. Caniggia, Spartaco, and Francescaromana Maradei. *Signal Integrity and Radiated Emission of High-Speed Digital Systems*. 1st ed. Newark: John Wiley & Sons, Incorporated, 2008. Howard W. Johnson, Martin Graham: High-speed Signal Propagation: Advanced Black Magic. Prentice Hall Professional, 2003.
	eResources addresses	Adresy na platformie eNauczanie:
Example issues/ example questions/ tasks being completed	PCB project	
Work placement	Not applicable	

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