



Subject card

Subject name and code	EMC of Integrated Devices, PG_00064041						
Field of study	Electronics and Telecommunications						
Date of commencement of studies	February 2026		Academic year of realisation of subject		2026/2027		
Education level	second-cycle studies		Subject group		Optional subject group Specialty subject group Subject group related to scientific research in the field of study		
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		exam		
Conducting unit	Department Of Microwave And Antenna Engineering -> Faculty Of Electronics Telecommunications And Informatics -> Wydziały Politechniki Gdańskiej						
Name and surname of lecturer (lecturers)	Subject supervisor		prof. dr hab. inż. Włodzimierz Zieniutycz				
	Teachers		prof. dr hab. inż. Włodzimierz Zieniutycz				
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		3.0		17.0	50
Subject objectives	Presentation of phenomena related to electromagnetic compatibility: coupling, crosstalk, electrostatic discharge, their description, methods of measurement and influence on design of high frequency network.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[K7_W03] knows and understands, to an increased extent, the construction and operating principles of components and systems related to the field of study, including theories, methods and complex relationships between them and selected specific issues - appropriate for the curriculum	student has mastered knowledge of parasitic radiation phenomena in RF & Microwave integrated circuits and systems as well as the methods of their measurements and prevention.	[SW3] Assessment of knowledge contained in written work and projects [SW1] Assessment of factual knowledge
	[K7_W02] knows and understands, to an increased extent, selected laws of physics and physical phenomena, as well as methods and theories explaining the complex relationships between them, constituting advanced general knowledge in the field of technical sciences related to the field of study	student has mastered the knowledge concerning radiated and conducted emissions, radiated and conducted susceptibilities, the sources of interferences, coupling, shielding methods and transmission of pulse in line including the effects of mismatching.	[SW1] Assessment of factual knowledge
	[K7_U02] can perform tasks related to the field of study as well as formulate and solve problems applying recent knowledge of physics and other areas of science	student has skills in determining the sources of interferences and in formulating the proposals of the prevention.	[SU4] Assessment of ability to use methods and tools [SU1] Assessment of task fulfilment
	[K7_U12] is able, to an increased extent, to analyze the operation of components and systems related to the field of study, as well as to measure their parameters and study their technical characteristics, and to plan and carry out experiments related to the field of study, including computer simulations, interpret the obtained results and draw conclusions	student has skills in measurement of the network parameters related to the electromagnetic compatibility and he can apply suitable software to simulate the interferences in the microwave networks.	[SU4] Assessment of ability to use methods and tools
Subject contents	Aspects and requirements for electromagnetic compatibility, conducted and radiated emissions and susceptibility, source of noise and interference, common and differential signals, method their separation and suppression, coupling in the wave structures and radiation sources, electric, magnetic and electromagnetic shielding effectiveness of the electronic components and cables, transmission lines and signal integrity, digital transmission in the coupled lines, matching effects influence the digital transmission, crosstalk, system design for PCB, chamber for EMC measurements		
Prerequisites and co-requisites	Basic on electrodynamics, theory of waveguiding structures, basic of RF & Microwaves		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	laboratory	50.0%	30.0%
	written test	50.0%	70.0%
Recommended reading	Basic literature	Clayton R.Paul Electromagnetic Compatibility, Wiley 2006	
	Supplementary literature	powerpoint presentation of the lecture	
	eResources addresses	Adresy na platformie eNauczanie:	

Example issues/ example questions/ tasks being completed	<ol style="list-style-type: none"> 1. Fundamental EMC phenomena which are subject to norms. 2. Describe the mechanism of EDS for example of the computer hardware operator. 3. How to measure common mode? 4. Describe the rules of the connection of coaxial cable to chassis. 5. Fundamental problems of magnetic field shielding for low frequencies
Work placement	Not applicable

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