GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	EMC of Integrated Devices, PG_00064041		
Field of study	Electronics and Telecommunications		
Date of commencement of studies	February 2027	Academic year of realisation of subject	2027/2028
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 -> Faculties of Gdańsk University of Technology		
Name and surname of lecturer (lecturers)	Subject supervisor	prof. dr hab. inż. Włodzimierz Zieniutycz	
	Teachers	prof. dr hab. inż. Włodzimierz Zieniutycz	

Lesson types	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 compatiblity: 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_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 skils 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
[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.	[SU1] Assessment of task fulfilment [SU4] Assessment of ability to use methods and tools
[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_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.	[SW1] Assessment of factual knowledge [SW3] Assessment of knowledge contained in written work and projects

Subject contents

Course content – lecture

Aspects and reguirements for electromagnetic compatibility, conducted and radiated emissions and susceptiblity, source of noise and interference , common and differential signals , method their separation and supression, 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 transmisssion 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 electrodymanics, theory of waveguiding sructures, basic of RF & Microwaves

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
written test	50.0%	70.0%
laboratory	50.0%	30.0%

Recommended reading

Basic literature	Clayton R.Paul Electromagnetic Compability, Willey 2006
Supplementary literature	powerpoint presentation of the lecture
eResources addresses	

Example issues/ example questions/ tasks being completed	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 chasssis. 5. Fundamental problems of magnetic field shielding for low frequencies
Practical activites within the subject	Not applicable

Document generated electronically. Does not require a seal or signature.