GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	CAD for High Frequencies Network and System Design, PG_00048666					
Field of study	Electronics and Telecommunications					
Date of commencement of studies	February 2024		Academic year of realisation of subject		2024/2025	
Education level	second-cycle studies		Subject group		Optional 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	1		Language of instruction		Polish	
Semester of study	2		ECTS credits		2.0	
Learning profile	general academic profile		Assessment form		assessment	
Conducting unit	Faculty of Electronics, Telecommunications and Informatics					
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Krzysztof Nyka				
	Teachers	dr hab. inż. Krzysztof Nyka inż. Kamil Trzebiatowski				

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	4.0	16.0	50

Subject objectives	The aim of the course is to familiarize students with the CAD tools (and their limitations) used in high-frequency electronics The course allows the student to explore specific aspects of computer aided modeling systems for very high frequencies - from the system level modelingto physical properties of elements,

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[K7_U04] can apply knowledge of programming methods and techniques as well as select and apply appropriate programming methods and tools in computer software development or programming devices or controllers using microprocessors or programmable elements or systems specific to the field of study, making assessment and critical analysis of the prepared software as well as a synthesis and creative interpretation of information presented with it	Ability to configure electromagnetic and system simulation software adapted to a specific design task	[SU1] Assessment of task fulfilment
	[K7_U05] can plan and conduct experiments related to the field of study, including computer simulations and measurements; interpret obtained results and draw conclusions	Ability to select an appropriate software tool and method for design of high frequency microwave circuits or components.	[SU4] Assessment of ability to use methods and tools
	[K7_W04] Knows and understands, to an advanced extent, the principles, methods and techniques of programming and the principles of computer software development or programming devices or controllers using microprocessors or programmable elements or systems specific to the field of study, and organisation of systems using computers or such devices	Knowledge of operation properties of simulation software used in CAD tool for different methods of circuit, system and electromagnetic simulation	[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.	Understanding of principles of numerical techniques used in CAD simulators	[SW1] Assessment of factual knowledge

Subject contents	Specific aspects of computer aided modeling of very high frequency systems - from system to model the physical properties of the elements; current status, prospects development. Circuit and field analysis techniques and modeling elements Overview of the most widely used numerical methods: - The method of finite difference (FD) - the method of moments (MoM), the Green's function - the finite element method (FEM) Issues definition of ports and "deembedding" simulator planar and three-dimensional overview of simulators field (2D, 2.5D, 3D) Simulation of circuit and system (ADS, AWR DE

Prerequisites and co-requisites	Fields and Waves, Electromagnetics, microwave circuits, numerical techniques, optimization

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Quiz	50.0%	20.0%
	Attendance	70.0%	40.0%
	Presenatation	50.0%	40.0%

Recommended reading	Basic literature	1. Bhargava, A., et al.: "Advanced Design System Circuit Design Cookbook 1.0", Agilent Technologies, 2008 2. Sadiku, M.N.O.: "Numerical Techniques in Electromagnetics", 2nd Ed., CRC Press, Boca Raton, Floryda, USA, 2001 3. Swanson, D.G, Hoefer, W.J.R.: "Microwave Circuit Modeling Using Electromagnetic Fielde Simulation", Norwood, MA, Artech House, 2003
	Supplementary literature	Not defined
	eResources addresses	Adresy na platformie eNauczanie:

Example issues/ example questions/ tasks being completed	Passive circuit design using various simulators and CAD packages and analysis of the results
Work placement	Not applicable

	Passive circuit design using various simulators and CAD packages and analysis of the results
	Not applicable