

关。GDAŃSK UNIVERSITY 创 OF TECHNOLOGY

Subject card

Subject name and code	Microwave Engineering, PG_00048081								
Field of study	Electronics and Telecommunications								
Date of commencement of studies	October 2020		Academic year of realisation of subject			2022/2023			
Education level	first-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	3		Language of instruction			Polish			
Semester of study	6		ECTS credits			2.0			
Learning profile	general academic profile		Assessment form			assessment			
Conducting unit	Department of Microwave and Antenna Engineering -> Faculty of Electronics, Telecommunications and Informatics							tions and	
Name and surname	Subject supervisor	dr hab. inż. Rafał Lech							
of lecturer (lecturers)	Teachers		dr inż. Małgorzata Warecka						
			dr hab. inż. Rafał Lech						
Lesson types and methods	Lesson type	Lecture	Tutorial	Laboratory	Project		Seminar	SUM	
of instruction	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	tivity Participation in classes include plan		I didactic Participation in consultation hours		Self-study SUM			
	Number of study hours	30		2.0		18.0		50	
Subject objectives	Student acquainted with the basic operation principles, parameters and design methods of the waveguides and microwave circuits The guides include waveguides and transmission lines with TEM wave. Procedures for microwave circuit design, including lumped elements circuits, microwavel dividers, couplers, phase shifters and non-reciprocal ferrite devices are determined on the base of their scattering matrix.								
Learning outcomes	Course outcome		Subject outcome			Method of verification			
	[K6_W34] Knows the characteristics of telecommunications channels, methods of securing information, modulation systems, methods of access to the channel.		student acquainted with the basic operation principles, parameters and design methods of the waveguides and microwave circuits The guides include waveguides and transmission lines with TEM wave. Procedures for microwave circuit design, including lumped elements circuits, microwavel dividers, couplers, phase shifters and non- reciprocal ferrite devices are determined on the base of their scattering matrix.			[SW1] Assessment of factual knowledge			
	[K6_U05] can plan and conduct experiments related to the field of study, including computer simulations and measurements; interpret obtained results and draw conclusions		Student acquainted with the basic operation principles, parameters and design methods of the waveguides and microwave circuits The guides include waveguides and transmission lines with TEM wave. Procedures for microwave circuit design, including lumped elements circuits, microwavel dividers, couplers, phase shifters and non- reciprocal ferrite devices are determined on the base of their scattering matrix.			[SU4] Assessment of ability to use methods and tools [SU2] Assessment of ability to analyse information			

Subject contents	1. Waveguides and resonators: rectangular, cylindrical, ridge the equiva-lent circuits, wave parameters, loop and electric probe fed guides and resonators 2. Strip and coaxial lines and resonators, multiconductor lines, the equiva-lent circuits, the higher TE and TM modes, connectors 3. Integrated lines and resonators; microstrip, slot line and coplanar tech-nology, the equivalent circuits and the parameters, surface waves and the higher order modes 4. The edge and broadside coupling striplines, microstrips slot lines, even and odd modes, their equivalent circuits and parameters 5. The impedance matching and tuning- single and double stub tuning. quarter wave transformers, realization technique, the parameters and design 6. Design of binomial and Chebyshev multisection matching transformers 7. Design principles of the inhomogeneous matching transformers 8. Discontinuites in waveguides, strip and microstrip lines and their equivalent circuits						
Prerequisites and co-requisites	No requirements						
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade				
	Practical exercise	40.0%	40.0%				
	Midterm colloquium	60.0%	60.0%				
Recommended reading	Basic literature	S. Rosłoniec "Liniowe obwody mikrofalowe" WKŁ 1999 2. J. Mazur" Inzynieria mikrofalowa " lecture notes, mwave .eti.pg.gda.pl 3D.Pozar"Microwave engineering" j.Willey&Sons, 1998					
	Supplementary literature	No requirements					
	eResources addresses	Adresy na platformie eNauczanie:					
Example issues/ example questions/ tasks being completed							
Work placement	Not applicable						