



Subject card

Subject name and code	Transmission and Switching Technology - laboratory, PG_00048129						
Field of study	Electronics and Telecommunications						
Date of commencement of studies	October 2022		Academic year of realisation of subject		2024/2025		
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		1.0		
Learning profile	general academic profile		Assessment form		assessment		
Conducting unit	Department of Teleinformation Networks -> Faculty of Electronics, Telecommunications and Informatics						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Magdalena Młynarczuk				
	Teachers		dr inż. Mariusz Dzwonkowski dr inż. Magdalena Młynarczuk				
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	0.0	0.0	15.0	0.0	0.0	15
	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	15		1.0		9.0	25
Subject objectives	Transfer of practical knowledge concerning the transmission and switching techniques, including channel-switching and packet-switching, implementation of spatial and time switching and techniques used for the transmission of digital signals and standards related to digital transmission.						
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 knows the characteristics of digital channels, information coding methods, digital modulations, ways to access the channel		[SW1] Assessment of factual knowledge		
	[K6_U09] can carry out a critical analysis of the functioning of existing technical solutions and assess these solutions, as well as apply experience related to the maintenance of technical systems, devices and facilities typical for the field of studies, gained in the professional engineering environment		Student is able to make a critical analysis of technical solutions for transmission links and switching nodes, evaluate these solutions		[SU1] Assessment of task fulfilment [SU2] Assessment of ability to analyse information		
	[K6_U31] can identify telecommunications network architectures, differentiates their areas and functional elements, evaluates the quality of service delivery, calculates parameters of functional elements		Student develops process control for the space switch. Student analyzes the properties of two- and three-section switching fabrics. Student assesses the impact of interference and distortion on the quality of digital transmission		[SU1] Assessment of task fulfilment [SU3] Assessment of ability to use knowledge gained from the subject [SU4] Assessment of ability to use methods and tools		
	[K6_W35] Knows the concepts of the technique of signal transmission, operation of telecommunications networks and multimedia services and the rules for providing them		Student knows the concepts of signal transmission technology in telecommunication networks and switching nodes in the network and the rules for their implementation		[SW1] Assessment of factual knowledge		

Subject contents	1. Evaluation of transmission techniques on the copper lines. 2. Evaluation of transmissions properties for xDSL systems in access network. 3. Evaluation of fiber optic links using reflectometric measurements. 4. Control of switching process between subscriber and receiver of digits. 5. Realization of packet switching functions by QoS IP nodes - 8x8 spatial switch. 6. Realization of packet switching functions by QoS IP nodes - a three-stage Clos pole of 64x64 size built from 8x8 switches.		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Practical exercise	50.0%	100.0%
Recommended reading	Basic literature	Laboratory instructions available in electronic form.	
	Supplementary literature	Horak R.: Telecommunications and data communications handbook John Wiley, 2007	
		Kula. S.: Teletransmission systems (in Polish), WKL, 2004	
	eResources addresses	Jajszczyk A.: Introduction to Telecommutation (in Polish), WNT, 2000	
		Adresy na platformie eNauczanie: Techniki transmisji i komutacji - laboratorium 2025 - Moodle ID: 44074 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=44074	
Example issues/ example questions/ tasks being completed			
Work placement	Not applicable		

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