



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 2021	Academic year of realisation of subject			2023/2024		
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. Magdalena Młynarczuk dr inż. Mariusz Dzwonkowski					
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_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_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_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. Examination of transmission techniques on the copper lines 2. Evaluation of transmissions properties for xDSL systems in access network 3. Evaluation of properties of interfaces and regenerative repeaters in transmission systems 4. Realization and control for digital space switch 5. Realization and control for bi-stage digital switching field 6. Evaluation of packet switching process in packet switching network model 7. Software control for given structure of tri-stage switching field		
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	Kula. S.: Systemy teletransmisyjne, WKL, 2004  Jajszczyk A.: Wstep do telekomutacji, WNT, 2000	
	Supplementary literature	Horak R.: Telecommunications and data communications handbook John Wiley, 2007	
	eResources addresses	Adresy na platformie eNauczenie: Techniki transmisji i komutacji - laboratorium 2024 - Moodle ID: 36178 <a href="https://enauczenie.pg.edu.pl/moodle/course/view.php?id=36178">https://enauczenie.pg.edu.pl/moodle/course/view.php?id=36178</a>	
Example issues/ example questions/ tasks being completed	Baseband transmission with echo cancellation (SHDSL system)  VDSL2 system - DMT multi-channel transmission  The properties of interfaces and regenerative repeaters for the E1 signal  Control of switching process between subscriber and receiver of digits  Realization of the packet switching function by the IP QoS node - 8x8 spatial switch  Realization of the packet switching function by the IP QoS nodes - a three-section Closa field with dimensions of 64x64 built of 8x8 switches		
Work placement	Not applicable		