GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Ethernet and IP Networks, PG_00047859					
Field of study	Biomedical Engineering					
Date of commencement of studies	October 2023		Academic year of realisation of subject		2025/2026	
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		3.0	
Learning profile	general academic profile		Assessment form		assessment	
Conducting unit	Department of Computer Communications -> Faculty of Electronics, Telecommunications and Informatics					
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Krzysztof Nowicki			
	Teachers		dr inż. Krzysztof Nowicki			

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	3.0	42.0	75

Subject objectives	Acquainted with the concept of Ethernet from end to end. Feasibility of the concept now and in the coming years. Acquainted with the problems of scalability, reliability, quality, manageability and offer services in Ethernet networks. Acquainted with modern IP networks solutions, migration from IPv4 to IPv6 and IPv6 protocol capabilities.

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[K6_U02] can perform tasks related to the field of study in an innovative way as well as solve complex and nontypical problems, applying knowledge of physics, in changing and not fully predictable conditions	Student describes the principles of Ethernet network cooperation with other networks Student explains the principles of managing Ethernet and IP networks	[SU1] Assessment of task fulfilment
	[K6_U07] can apply methods of process and function support, specific to the field of study	Student designs solutions to raise security level of systems based on Ethernet and IP technologies Student employs real-world equipment	[SU4] Assessment of ability to use methods and tools
	[K6_W03] knows and understands, to an advanced 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	The student knows the structure and operation principles of Ethernet / IP components and systems, including CE and IPv6	[SW1] Assessment of factual knowledge

Subject contents	History of Ethernet and IP networks. Standardization processesDominance of Ethernet solutions on the market of local and city networks. Gigabit solutions (10/40/100/400/800 Gbps) Ethernet End-to-end Ethernet concept. Carrier Ethernet (services, scalability, manageability, QoS, reliability). Ethernet solutions compatibility. PoE device power supply problems. Adapting Ethernet to IP protocols. Supporting multicast broadcasts. Industrial / Automotive Ethernet. Principles of cooperation of Ethernet networks with wireless solutions.An overview of the IPv6 concept. Basics of IPv6 addressing - unicast, multicast, anycast addressing. Address allocation and the problem of routing tables. Static and dynamic configuration of IPv6 and DNS. IPv4 / IPv6 network coexistence. Migration methods. Services on IPv6 networks. VoIP.Security in Ethernet and IP networks. Prospects for the development of Ethernet and IP networks. Cooperation of Ethernet and IP networks.
Prerequisites and co-requisites	Completed course "Computer Networks" lecture + laboratory

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Practical exercise	50.0%	50.0%
	Midterm colloquium	50.0%	50.0%

Recommended reading	Basic literature	Nowicki K.: Ethernet - sieci, mechanizmy, Infotech 2006
		Nowicki K., Światowiak J.: Protokoły IPv6, PG, 2002. .
	Supplementary literature	Nowicki K., Uhl T.: Ethernet End-to-End, Shaker Verlag 2008
		Nowicki K., Woźniak J.: Przewodowe i bezprzewodowe sieci LAN, OW PW 2002
		An IPv6 Deployment Guide, The 6NET Consortium, September 2005
		Krawczyk H., Kaczmarek S., Nowicki K.: Aplikacje i usługi a technologie sieciowe, WN PWn 2018
	eResources addresses	Adresy na platformie eNauczanie:

Example issues/ example questions/ tasks being completed	Sniffing in switched environments
	IPv6 systems configuration

Work placement	Not applicable

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