

GDAŃSK UNIVERSITY

Subject card

Subject name and code	Ethernet and IP Networks, PG_00053920								
Field of study	Automatic Control, Cybernetics and Robotics								
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 Computer Communications -> Faculty of Electronics, Telecommunications and Informatics						nformatics		
Name and surname	Subject supervisor		dr inż. Krzyszt	of Nowicki					
of lecturer (lecturers)	Teachers		dr inż. Krzysz	tof Nowicki					
Lesson types and methods	Lesson type	Lecture	Tutorial	Laboratory	Projec	t	Seminar	SUM	
of instruction	Number of study hours	15.0	0.0	0.0	0.0		0.0	15	
	E-learning hours included: 0.0								
Learning activity and number of study hours	Learning activity	Participation in classes includ plan	n didactic ed in study	Participation in consultation hours		Self-study		SUM	
	Number of study hours	15		2.0		8.0		25	
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_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			
	[K6_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		Student describes the principles of Ethernet network cooperation with other networks Student explains the principles of managing Ethernet and IP networks. Student applies solutions that increase the security of Ethernet and IPv6 networks. The student uses real hardware solutions			[SU4] Assessment of ability to use methods and tools			

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.						
Prerequisites and co-requisites	Completed course "Computer Networks" lecture + lab.						
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 Supplementary literature	Nowicki K.: Ethernet - sieci, mechanizmy, Infotech 2006 Nowicki K., Światowiak J.: Protokoły IPv6, PG, 2002					
		Nowicki K., Uhl T.: Ethernet End-to-End, Shaker Verlag 2008Nowicki K., Woźniak J.: Przewodowe i bezprzewodowe sieci LAN, OW PW 2002 An IPv6 Deployment Guide, The 6NET Consortium, September 2005Krawczyk H., Kaczmarek S., Nowicki K.: Aplikacje i usługi a technologie sieciowe, PWN 2018					
	eResources addresses	Adresy na platformie eNauczanie: Sieci Ethernet i IP 2024 - Moodle ID: 37720 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=37720					
Example issues/ example questions/ tasks being completed	Introduce the concept of the Ethernet end-to-endWhat is fit to Ethernet IP protocolsPresent methods of network migration IPv4-> IPv6						
Work placement	Not applicable						