



## Subject card

Subject name and code	Computer Networks - laboratory, PG_00047674						
Field of study	Informatics						
Date of commencement of studies	October 2021	Academic year of realisation of subject			2023/2024		
Education level	first-cycle studies	Subject group			Obligatory subject group in the field of study 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	5	ECTS credits			1.0		
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	mgr inż. Jakub Grochowski dr inż. Michał Hoefft dr inż. Krzysztof Nowicki					
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	Learning major layered networking architectures, protocols and network standards						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	[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 uses various network device management techniques. Student deploys virtual LAN technologies.			[SU4] Assessment of ability to use methods and tools		
	[K6_U06] can analyse the operation of components, circuits and systems related to the field of study, measure their parameters and examine technical specifications	Student applies LAN and WAN knowledge in practice. Student operates real hardware networking solutions.			[SU4] Assessment of ability to use methods and tools		
	[K6_U42] can apply tools and methods of designing, optimization, monitoring, management, increasing reliability and protection from safety hazards in local and distributed information systems and applications	Student applies solutions which improve network security. Student deploys static routing in IP networks.			[SU2] Assessment of ability to analyse information		

Subject contents	1. Classification and general description of computer networks 2. Layered network architectures - ISO-OSI, TCP/IP 3. The theoretical basis for data communications 4. Data Link Layer design issues (synchronization, flow control, error detection and correction, multiplexing) 5. Local area networks - general characteristics - channel access methods 6. Contention type solutions: Ethernet networks - MAC sublayer functions and channel access principles - standard IEEE 802.3 7. Wireless LAN networks - basic characteristics 8. IEEE 802.11 standard - operational modes 9. IEEE 802.11 standard - channel access methods 10. New Ethernet technologies 11. 10/40/100 Gb/s Ethernet 12. EFM 13. Methods of connecting LAN networks 14. VLAN 15. Wide Area Networks - WANs 16. TCP/IP architecture - IP and transport protocols 17. IPv6 protocols, addresses 18. DHCPv6, DNSv6 19. Migration IPv4/IPv6 20. Routing solutions in WAN networks 21. End-to-end flow control in IP networks 22. Congestion control in IP networks 23. Basic model supporting mobile stations in IP networks - MIP 24. Network security 1.VLAN 2.Routing 3.Network management 4. WLAN 802.11 performance/security 5. IP network diagnostics		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Laboratory exercises	50.0%	100.0%
Recommended reading	Basic literature	Nowicki K., Woźniak J. : Przewodowe i bezprzewodowe sieci LAN. Oficyna wyd. PW Materiały z wykładu Nowicki K. Sieci Ethernet Nowicki K, Świątowski J.: Protokoły IPv6 Woźniak J., Nowicki K.: Sieci LAN, MAN, WAN - protokoły komunikacyjne. Wyd. Postępu Telekomunikacji	
	Supplementary literature	No requirements	
	eResources addresses	Adresy na platformie eNauczanie: Sieci komputerowe lab. Informatyka sem.V 2023/24 - Moodle ID: 33275 <a href="https://enauczanie.pg.edu.pl/moodle/course/view.php?id=33275">https://enauczanie.pg.edu.pl/moodle/course/view.php?id=33275</a>	
Example issues/ example questions/ tasks being completed			
Work placement	Not applicable		