



## Subject card

Subject name and code	Computer Networks, PG_00047843						
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	Part-time studies		Mode of delivery		at the university		
Year of study	3		Language of instruction		Polish		
Semester of study	5		ECTS credits		4.0		
Learning profile	general academic profile		Assessment form		exam		
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  Zenon Werbowy  dr inż. Krzysztof Gierłowski				
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		8.0		62.0	100
Subject objectives	Student becomes familiar with logical layered architectures, classifies basic networking problems and identifies and analyzes selected protocols and mechanisms implemented in standard LAN and WAN solutions						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[K6_W42] Knows and understands, to an advanced extent, architecture, design principles and methods of hardware and software support for local and distributed information systems, including computing systems, databases, computer networks and information applications, as well as the principles of human cooperation with computers and computer-aided teamwork	The student has knowledge about basic architectures, protocols and network devices. Student is able to analyze the work of selected devices and protocols used in LAN and IP networks	[SW1] Assessment of factual knowledge
	[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 has knowledge of wired and wireless networks described by the standards of the IEEE 802 series. The student has knowledge about the basic protocols of IP networks. The student knows the principles of operation of switches and routers	[SW1] Assessment of factual knowledge
	[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 is able to analyze the operation of network elements, systems and systems as well as measure their parameters and test technical characteristics	[SU1] Assessment of task fulfilment [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	The student is able to assess the changes and trends occurring in the analyzed network technologies. The student is able to assess the current state and trends observed in standardization and implementation works, as well as assess processes taking place on the ICT technology market.	[SU2] Assessment of ability to analyse information
	[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	The student is able to use the tools and methods of design, optimization, monitoring, management, increasing reliability and protection against security threats in local and wide area networks	[SU1] Assessment of task fulfilment [SU4] Assessment of ability to use methods and tools
Subject contents	<p>1. General characteristics of the goals of computer networks, applications, classifications</p> <p>2. The logical architecture of the ISO / OSI and TCP / IP</p> <p>3. The mechanisms controlling the flow of information in networks.</p> <p>4. Access protocols. Addressing issues in LAN</p> <p>5. Selected technologies for wired and wireless LAN and MAN - general characteristics.</p> <p>6. Standard series 802.3 Ethernet</p> <p>7. Evolution of Ethernet: Fast Ethernet and 1/10 Gigabit Ethernet</p> <p>8. Wireless Networks WLAN-basic</p> <p>9. IEEE 802.11 (a, b, g, e).</p> <p>10. WAN standards of basic problems.</p> <p>11. LAN connection method - characteristics</p> <p>12. Organization of IP networks.</p> <p>13. Cooperation between networks (Internet &amp; Internet, corporate networks, VPNs),</p> <p>14. Routing Protocols</p> <p>15. QoS Architecture for IP networks and computer network security.</p> <p>16. Network services</p> <p>Lab.</p> <p>1. Network Management</p> <p>2. Virtual Local Area Networks</p> <p>3. Static and Dynamic Routing</p> <p>4. 802.11 wireless network configuration</p> <p>5. IP Network Diagnostics</p> <p>6. Network monitoring</p>		

Prerequisites and co-requisites	No recommendations		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	lec.	50.0%	50.0%
	lab.	50.0%	50.0%
Recommended reading	Basic literature	Nowicki K., Woźniak J.: Przewodowe i bezprzewodowe sieci LAN, OW PW 2002	
	Supplementary literature	Nowicki K.: Ethernet - sieci, mechanizmy, Infotech 2006  Krawczyk H., Kaczmarek S., Nowicki K.: Aplikacje i usługi a technologie sieciowe, WN PWN 2018  Tannenbaum A.: Sieci komputerowe, Helion	
	eResources addresses	Adresy na platformie eNauczanie: Sieci komputerowe NST sem.V 2023/24 - Moodle ID: 33286 <a href="https://enauczanie.pg.edu.pl/moodle/course/view.php?id=33286">https://enauczanie.pg.edu.pl/moodle/course/view.php?id=33286</a>	
Example issues/ example questions/ tasks being completed	Description of network architectures and basic standards. Comparison of selected standard wired and wireless LAN networks. Comparison of methods and devices for connecting networks. Description of addressing methods in LAN and WAN networks. Description and comparison of selected routing protocols and basic communication protocols in IP networks. Description of selected network applications.		
Work placement	Not applicable		