



## Subject card

Subject name and code	Computer Networks, PG_00048818						
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	5	ECTS credits			2.0		
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 prof. dr hab. inż. Józef Woźniak					
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	0.0	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	2.0		18.0	50	
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_W35] Knows the concepts of the technique of signal transmission, operation of telecommunications networks and multimedia services and the rules for providing them	1. Student classifies various telecommunications and computer network solutions 2. The student has knowledge of selected network applications and the principles of their implementation.			[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	1. Student defines logical architectures of computer networks. 2. Student identifies wired LAN solutions. 3. Student identifies the characteristic features of the technology wireless standards IEEE 802 series. 4. Student identifies and explains features of IP and UDP/TCP protocols. 5. Student differentiates routing algorithms used in WAN networks. 6. Student explains the principles of traffic control in IP networks.			[SU2] Assessment of ability to analyse information		

Subject contents	1. Classification and general description of computer networks 2. Packet and circuit switching 3. Layered network architectures - ISO-OSI 4. Layered network architectures - ISO-OSI, TCP/IP 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. General characteristics of other wired LAN solutions 8. Wireless LAN networks - basic characteristics 9. IEEE 802.11 standard - operational modes 10. IEEE 802.11 standard - channel access methods 11. New Ethernet technologies 12. Fast Ethernet Networks 13. 10/40/100 Gb/s Ethernet 14. EFM 15. OAM Ethernet 16. Methods of connecting LAN networks 17. Hub 18. Switching 19. Switches 20. Routing 21. VLAN 22. Wide Area Networks - WANs 23. TCP/IP architecture - IP protocols 24. TCP/IP architecture - transport protocols 25. TCP/IP architecture - application 26. IPv6 protocols 27. Routing solutions in WAN networks 28. End-to-end flow control in IP networks 29. Congestion control in IP networks 30. Network security 31. Selected applications and network services.		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
Recommended reading	Midterm colloquium	50.0%	100.0%
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	Tannenbaum A.: Computer Networks, Prentice Hall;  Stallings W.: High Speed Networks and Internets. Prentice Hall  Krawczyk H., Kaczmarek S. Nowicki K.: Aplikacje i usługi a technologie sieciowe. PWN 2018		
eResources addresses	Adresy na platformie eNauzanie: SIECI KOMPUTEROWE - (EiT) 2023/24 - Moodle ID: 31539 <a href="https://enauzanie.pg.edu.pl/moodle/course/view.php?id=31539">https://enauzanie.pg.edu.pl/moodle/course/view.php?id=31539</a>		
Example issues/ example questions/ tasks being completed	Description of network architectures and basic standards.  Comparison of 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		