



Subject card

Subject name and code	Computer Networks, PG_00047711						
Field of study	Informatics						
Date of commencement of studies	October 2023	Academic year of realisation of subject			2023/2024		
Education level	second-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	1	Language of instruction			Polish		
Semester of study	1	ECTS credits			7.0		
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 dr inż. Wojciech Gumiński dr inż. Michał Hoefft mgr inż. Jakub Grochowski dr inż. Krzysztof Gierłowski prof. dr hab. inż. Józef Woźniak					
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	24.0	0.0	15.0	0.0	0.0	39
	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	39	12.0		124.0	175	
Subject objectives	Student 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
	[K7_U02] can perform tasks related to the field of study as well as formulate and solve problems applying recent knowledge of physics and other areas of science	The student is able to perform tasks related to problems occurring in computer systems and networks	[SU1] Assessment of task fulfilment
	[K7_W02] Knows and understands, to an increased extent, selected laws of physics and physical phenomena, as well as methods and theories explaining the complex relationships between them, constituting advanced general knowledge in the field of technical sciences related to the field of study	1. Student knows the principles of assessing reliability of networks. 2. Defines the QoS models of services in IP networks (IP QoS). 3. Defines the concept of justice and geolocation in networks. 4. Defines the concept of net neutrality	[SW1] Assessment of factual knowledge
	[K7_W03] Knows and understands, to an increased 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.	1. Student knows network architectures and general principles of network communication. 2. Identifies the basic problems of information transmission using digital signals 3. Identifies the relationships between media and signal parameters and bandwidth and throughput. 4. It differentiates the principles of multiplexing access in the media and methods of device operation synchronization and basic algorithms of transmission security.	[SW1] Assessment of factual knowledge
	[K7_W42] Knows and understands, to an increased extent, the principles and trends in the analysis and design of local and distributed IT systems and the basics of computer modeling and computerization of complex cognitive and decision-making processes.	1. Student knows network architectures and communication protocols. 2. Identifies flow control methods in the data link layer (ARQ) 3. Identifies the rules of the control algorithms used in the TCP protocol	[SW1] Assessment of factual knowledge
	[K7_U06] can analyse the operation of components, circuits and systems related to the field of study; measure their parameters; examine technical specifications; interpret obtained results and draw conclusions	Student is able to use methods and tools characteristic of ICT technology, in particular LAN networks of IEEE 802 series standards and IP networks	[SU4] Assessment of ability to use methods and tools
Subject contents	<p>Transmission media - structured cabling standards</p> <p>Basic networking concepts - overview and analysis of layered architectures Fundamentals of signal and information theory Mechanisms of data link layer - multiplexing, synchronization and coding principles Flow control in the data link layer - ARQ algorithms Methods to ensure fairness of service and proper access to network resources</p> <p>Providing differentiated quality of service in IP networks - IP QoS models</p> <p>IPv6 solutions</p> <p>Methods for flow control at the transport layer protocol for example TCP</p> <p>Basic problems of geolocation in computer networks</p> <p>Problems of ensuring net neutrality</p> <p>Cloud systems</p>		
Prerequisites and co-requisites	Required knowledge of the basics of computer networks operation		

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	lecture	50.0%	60.0%
	lab	50.0%	40.0%
Recommended reading	Basic literature	<p>K. Nowicki, J. Światowiak: Protokoły IPv6</p> <p>Krawczyk H., Kaczmarek S., Nowicki K.: Aplikacje i usługi a technologie sieciowe, WN PWN 2018</p> <p>F. Halsall: Data Communications, Computer Networks and Open Systems. Addison-Wesley</p> <p>Lecture materials available in the form of pdf files</p>	
	Supplementary literature	<p>J. Woźniak, K. Nowicki; Sieci LAN, MAN, WAN: protokoły komunikacyjne. O.W Politechniki Warszawskiej</p> <p>A. Tanenbaum: Computer Networks, J. Wiley</p> <p>W. Stallings: High-Speed Networks. Performance and Quality of Service, Prentice Hal</p>	
	eResources addresses	<p>Adresy na platformie eNauczanie:</p> <p>Sieci komputerowe MSU 2023/24 - Moodle ID: 31541</p> <p>https://enauczanie.pg.edu.pl/moodle/course/view.php?id=31541</p>	
Example issues/ example questions/ tasks being completed	Issues and exam questions include a list of lecture topics		
Work placement	Not applicable		