



Subject card

Subject name and code	Wireless Local Networks, PG_00047896						
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			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			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 Gierłowski					
	Teachers	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		1.0		19.0	50
Subject objectives	The aim of the course is to acquaint students with the basic principles of operation of standard wireless networks, as well as elements of the evaluation of the quality of these networks.						
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	1. Student identifies characteristics of wireless technologies described by IEEE 802 standards. 2. Student describes mechanisms of IEEE 802-based wireless networks. 3. Student evaluates security level of systems based on these technologies.			[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	1. Student examines the working efficiency of the IEEE 802.11 and IEEE 802.15.1 series wireless technology. 2. Student assesses the level of security of the above technologies			[SU1] Assessment of task fulfilment [SU4] Assessment of ability to use methods and tools		
[K6_W01] Knows and understands, to an advanced extent, mathematics necessary to formulate and solve simple issues related to the field of study	1. The student is able to solve simple problems that increase the level of network security. 2. The student has knowledge of real hardware solutions.			[SW1] Assessment of factual knowledge			

Subject contents	1. Classification of wireless networks: Overview of wireless systems 2. Basic features and applications of wireless networks 3. Features and parameters of transmission media, characteristics of radio and optical systems 4. Multiple access techniques (FDMA, TDMA, CDMA, SDMA) 5. Classification of channel access protocols: Evaluation of effectiveness of multiple access techniques 6. Characteristics of contention type algorithms (ALOHA, S-ALOHA, CSMA) 7. WLAN solutions principles of organization and operational modes 8. Standard WLAN solution - IEEE 802.11 9. Evaluation of DCF mode effectiveness CSMA/CA. PCF analysis 10. MAC QoS architecture traffic service differentiation in IEEE 802.11e 11. Selected WLAN design issues implementation and testing of WLANs. Operational modes of WiFi devices 12. Security of IEEE 802.11 - WEP protocol 13. Security of IEEE 802.11 WLANs - WEP and IEEE 802.11i protocols 14. PAN networks: Bluetooth and its profiles 15. Mobility support offered by MIP		
Prerequisites and co-requisites	Computer Networks		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Midterm colloquium	50.0%	50.0%
	Practical exercise	50.0%	50.0%
Recommended reading	Basic literature	Nowicki K., Woźniak J.: Przewodowe i bezprzewodowe sieci LAN, OW PW 2002 Yu-Kwong Ricky Kwok, Vincent K.N. Lau: Wireless Internet and mobile computing, Wiley 2007	
	Supplementary literature	Hać A.: Mobile telecommunications protocols for data networks, Wiley 2007 Zheng J., Jamalipour A.: Wireless sensor networks. J. Wiley, 2012	
	eResources addresses	Adresy na platformie eNauczenie: Lokalne sieci bezprzewodowe (2024L) - Moodle ID: 37072 https://enauczenie.pg.edu.pl/moodle/course/view.php?id=37072	
Example issues/ example questions/ tasks being completed	Wireless networks efficiency, standard algorithms for WLAN operation, access point modes of operation, WLAN security		
Work placement	Not applicable		