



Subject card

Subject name and code	Local and Matropolitan Wireless Networks, PG_00047745						
Field of study	Informatics						
Date of commencement of studies	October 2022	Academic year of realisation of subject			2023/2024		
Education level	second-cycle studies	Subject group			Optional subject group 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	2	Language of instruction			Polish		
Semester of study	3	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 Gierłowski					
	Teachers	dr inż. Krzysztof Gierłowski dr inż. Michał Hoefft					
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	12.0	0.0	9.0	6.0	0.0	27
	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	27	10.0		63.0	100	
Subject objectives	To familiarize students with the principles of operation and design of wireless networks						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[K7_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 advanced technical systems, devices and facilities typical for the field of studies, gained in the professional engineering environment	Student applies knowledge on wireless IEEE 802.11 and IEEE 802.15.1	[SU4] Assessment of ability to use methods and tools
	[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	Student applies real-life wireless hardware solutions.	[SW2] Assessment of knowledge contained in presentation
	[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.	Student explains operating principles of IEEE 802 wireless standards.	[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.	Student identifies key attributes of IEEE 802 wireless technology standards.	[SW1] Assessment of factual knowledge
[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	Student tests efficiency of known wireless technologies.	[SU4] Assessment of ability to use methods and tools	
Subject contents	<p>Classification of wireless networks Overview of wireless systems Basic features and applications of wireless networks Features and parameters of transmission media, characteristics of radio and optical systems Multiple access techniques (FDMA, TDMA, CDMA, SDMA) Classification of channel access protocols: Evaluation of effectiveness of multiple access techniques Characteristics of contention type algorithms (ALOHA, S-ALOHA, CSMA) Standard WLAN solutions - principles of organization and operational modes - IEEE 802.11 - DCF, PCF, ETSI HIPERLAN Evaluation of DCF mode effectiveness CSMA/CA. PCF analysis MAC QoS architecture traffic service differentiation in IEEE 802.11e - EDCA Security of IEEE 802.11 - WEP, WPA and WPA2 protocols Authentication and authorization procedures based on IEEE 802.1x and RADIUS Selected WLAN design issues implementation and testing of WLANs. Operational modes of WiFi devices PAN networks: Bluetooth and its profiles Coexistence of BT and WiFi networks Routing algorithms for ad hoc networks Operational modes of WiMAX - IEEE 802.16 Mobility support offered by MIP Introduction to project topics Coordination of students projects Final conclusions of students projects</p>		
Prerequisites and co-requisites	Basic knowledge of computer networks		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Written exam	50.0%	40.0%
	Practical exercise	50.0%	30.0%
	Project	50.0%	30.0%
Recommended reading	Basic literature	lecture materials 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	

	eResources addresses	Adresy na platformie eNauczenie: Projektowanie sieci bezprzewodowych (2023Z) - Moodle ID: 34617 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=34617
Example issues/ example questions/ tasks being completed	Issues and exam questions cover lecture topics	
Work placement	Not applicable	