



Subject card

Subject name and code	Wireless Systems Design I, PG_00048116						
Field of study	Electronics and Telecommunications						
Date of commencement of studies	October 2022	Academic year of realisation of subject				2024/2025	
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				1.0	
Learning profile	general academic profile	Assessment form				assessment	
Conducting unit	Department of Radiocommunication Systems and Networks -> Faculty of Electronics, Telecommunications and Informatics						
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Piotr Rajchowski					
	Teachers	dr inż. Piotr Rajchowski					
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	0.0	0.0	0.0	15
	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	15	1.0		9.0		25
Subject objectives	Gaining knowledge about designing of wireless networks with a cellular structure, especially 5G, networks for special applications and telemetry networks. In addition, gaining knowledge about the methodology of basic measurements in wireless networks.						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	[K6_W06] Knows and understands the basic processes occurring in the life cycle of devices, facilities and systems specific to a given field of study.	The student learned the basics knowledge related to the methodology of designing wireless networks, including knowledge about usage of technical components.			[SW3] Assessment of knowledge contained in written work and projects		
	[K6_U31] can identify telecommunications network architectures, differentiates their areas and functional elements, evaluates the quality of service delivery, calculates parameters of functional elements	Student has learned how to analyze the network elements related to the main field of study and has learned the methodology for measuring their parameters, including being able to interpret technical characteristics.			[SU4] Assessment of ability to use methods and tools		
Subject contents	Basic concepts and types of radio communication networks. Commercial networks (open), closed networks, telemetry networks. Traffic characteristics in wireless networks. Synchronization and latency in the network, impact on services quality. Radio communication device specifications and terminology (English). Propagation analysis and network operation area. Stages of planning and designing wireless networks, laboratory tests. Optimization of wireless networks. Basics of reliability of wireless networks. Radio communication networks for special applications. Verification of design assumptions, implementation of network measurements. Description of design and final documentation.						
Prerequisites and co-requisites							
Assessment methods and criteria	Subject passing criteria	Passing threshold			Percentage of the final grade		
	Midterm colloquium	50.0%			100.0%		

Recommended reading	Basic literature	Meik Kottkamp i inni, 5G New Radio, Rohde&Schwarz, 2019 Claude Oestges, Francois Quitin, Inclusive Radio Communications for 5G and Beyond, Elsevier, 2021 Harri Holma i inni, LTE Small Cell Optimization, Wiley, 2016 Stefania Sesia i inni, LTE The UMTS Long Term Evolution, Wiley, 2011 Martin Sauter, From GSM to LTE-Advanced PRO and 5G, Wiley, 2017 Martin Sauter, From GSM to LTE-Advanced, Wiley, 2014 Yang Yang i inni, 5G Wireless Systems, Springer, 2018 Hossam Fattah, 5G LTE Narrowband Internet of Things (NB-IoT), CRC Press, 2017 Moray Rumney Agilent Technologies, LTE and the Evolution to 4G Wireless, Wiley, 2013 Narcis Cardona, Cooperative Radio Communications for Green Smart Environments, River Publishers, 2016 3GPP and ITU documentation.
	Supplementary literature	No requirements
	eResources addresses	Adresy na platformie eNauczenie: Projektowanie sieci bezprzewodowych I - 2024/2025 - Moodle ID: 39967 https://enauczenie.pg.edu.pl/moodle/course/view.php?id=39967
Example issues/ example questions/ tasks being completed	Not applicable	
Work placement	Not applicable	

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