



Subject card

Subject name and code	Wireless Systems Design I, PG_00048116						
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 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	The aim of the course is to acquire knowledge in the field of designing modern wireless networks, including: private general-purpose networks and 2G-5G mobile 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 of the main issues related to the methodology of designing contemporary wireless systems, including environmental conditions, radio channel influence and technical parameters of the hardware equipment.		[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 learned to analyze the operation of elements, systems and systems related to the field of study and is familiar with their parameters and can examine technical characteristics		[SU4] Assessment of ability to use methods and tools		
Subject contents	1 Basic concepts and classification of wireless systems and networks 2 Open and closed wireless networks, applications 3 Traffic theory for radio communications 4 Circuit and packet switching in cellular networks 5 Principles of radio networks reliability 6 Connectivity and network delay analysis 7 Topology optimization of cellular network 8 Basic algorithms for the optimization procedures 9 Propagation and working - range analysis 10 Equipment specification for radio communications 11 Stages of a network planning 12 Selected problems of a network implementation 13 Network project as a formal document 14 Practical verification of design assumptions 15 Credit for a course						
Prerequisites and co-requisites							
Assessment methods and criteria	Subject passing criteria		Passing threshold		Percentage of the final grade		
	Final colloquium		50.0%		100.0%		

Recommended reading	Basic literature	<p>Meik Kottkamp i inni, 5G New Radio, Rohde&Schwarz, 2019</p> <p>Claude Oestges, Francois Quitin, Inclusive Radio Communications for 5G and Beyond, Elsevier, 2021</p> <p>Harri Holma i inni, LTE Small Cell Optimization, Wiley, 2016</p> <p>Stefania Sesia i inni, LTE The UMTS Long Term Evolution, Wiley, 2011</p> <p>Martin Sauter, From GSM to LTE-Advanced PRO and 5G, Wiley, 2017</p> <p>Martin Sauter, From GSM to LTE-Advanced, Wiley, 2014</p> <p>Yang Yang i inni, 5G Wireless Systems, Springer, 2018</p> <p>Hossam Fattah, 5G LTE Narrowband Internet of Things (NB-IoT), CRC Press, 2017</p> <p>Moray Rumney Agilent Technologies, LTE and the Evolution to 4G Wireless, Wiley, 2013</p> <p>Narcis Cardona, Cooperative Radio Communications for Green Smart Environments, River Publishers, 2016</p>
	Supplementary literature	No requirements
	eResources addresses	<p>Adresy na platformie eNauczanie:</p> <p>Projektowanie sieci bezprzewodowych I - 2023/2024 - Moodle ID: 22223</p> <p>https://enauczanie.pg.edu.pl/moodle/course/view.php?id=22223</p>
Example issues/ example questions/ tasks being completed	No requirements	
Work placement	Not applicable	