



## Subject card

Subject name and code	Radio Communication Systems, PG_00048121						
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		
Semester of study	5	ECTS credits			2.0		
Learning profile	general academic profile	Assessment form			exam		
Conducting unit	Department of Radiocommunication Systems and Networks -> Faculty of Electronics, Telecommunications and Informatics						
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Andrzej Marczak					
	Teachers	dr inż. Andrzej Marczak					
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	0.0	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	2.0		18.0	50	
Subject objectives	The aim of the course is teach students the types of radiocommunication systems.						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	[K6_U31] can identify telecommunications network architectures, differentiates their areas and functional elements, evaluates the quality of service delivery, calculates parameters of functional elements	The student is able to identify the architecture of radio communication networks and distinguishes between their functional elements.			[SU1] Assessment of task fulfilment		
	[K6_K02] is ready to critically assess possessed knowledge and acknowledge the importance of knowledge in solving cognitive and practical problems	The student is able to choose the right radio communication system for specific applications.			[SK5] Assessment of ability to solve problems that arise in practice		
	[K6_W34] Knows the characteristics of telecommunications channels, methods of securing information, modulation systems, methods of access to the channel.	The student distinguishes between the basic multiple access methods and determines the basic properties of the radiocommunication channel.			[SW1] Assessment of factual knowledge		
[K6_W35] Knows the concepts of the technique of signal transmission, operation of telecommunications networks and multimedia services and the rules for providing them	Student describes the properties of various types of the radio communication systems.			[SW1] Assessment of factual knowledge			

Subject contents	<ol style="list-style-type: none"> <li>1. Idea of radio communication system and network. Mobile and fixed communication system.</li> <li>2. Architecture of system, base station and mobile terminal.</li> <li>3. Multiple access methods FDMA, TDMA, CDMA, characteristics and comparison.</li> <li>4. Switching modes: channel switching and packet switching, their features and analysis. Applications.</li> <li>5. Characteristics and description of radio channel: noise, fading.</li> <li>6. Terrestrial radio communication systems.</li> <li>7. Satellite radio communication systems.</li> <li>8. The cellular system concept.</li> <li>9. Cell cluster, frequency reuse.</li> <li>10. First generation cellular systems.</li> <li>11. Digital cellular systems, their architecture and services.</li> <li>12. The GSM cellular system.</li> <li>13. The equipment of base stations, and mobile terminals.</li> <li>14. Elements of the cellular network architecture.</li> <li>15. Voice and data transmission in the GSM.</li> <li>16. The HSCSD, the GPRS and the EDGE high speed data subsystems.</li> <li>17. Physical and logical channels in GSM.</li> <li>18. Principles of operation and organisation of trunked radio systems.</li> <li>19. Characteristics and applications of trunked radio systems.</li> <li>20. The TETRA trunked radio system.</li> <li>21. Digital wireless telephony systems.</li> <li>22. The DECT system.</li> <li>23. The UMTS, 3rd generation cellular system.</li> <li>24. Architecture of the UMTS system.</li> <li>25. The IEEE802.15.1 Bluetooth wireless data transmission standard.</li> <li>26. The IEEE802.15.4 ZigBee wireless data transmission standard.</li> <li>27. The IEEE802.16 WIMAX wireless data transmission standard.</li> <li>28. The IEEE802.11 wireless local area network standard.</li> <li>29. Technical solutions used in modern radio communication systems.</li> <li>30. Software defined radio.</li> </ol>											
Prerequisites and co-requisites	No requirements											
Assessment methods and criteria	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 40%;">Subject passing criteria</th> <th style="width: 30%;">Passing threshold</th> <th style="width: 30%;">Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td>Written exam</td> <td>51.0%</td> <td>100.0%</td> </tr> </tbody> </table>			Subject passing criteria	Passing threshold	Percentage of the final grade	Written exam	51.0%	100.0%			
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Example issues/ example questions/ tasks being completed												
Work placement	Not applicable											