GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Radio Communication Systems, PG_00048121		
Field of study	Electronics and Telecommunications		
Date of commencement of studies	October 2024	Academic year of realisation of subject	2026/2027
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 -> Faculties of Gdańsk University of Technology		
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Andrzej Marczak	
	Teachers	dr inż. Andrzej Marczak	

Lesson types

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

eNauczanie source addresses:

Moodle ID: 8104 Systemy radiokomunikacyjne - wykład 2026/2027
https://enauczanie.pg.edu.pl/2025/course/view.php?id=8104

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

<table>
<tr><td>Subject contents</td><td>Course content – lecture

1. Idea of radio communication system and network. Mobile and fixed communication system.
2. Architecture of system, base station and mobile terminal.
3. Multiple access methods FDMA, TDMA, CDMA, characteristics and comparison.
4. Switching modes: channel switching and packet switching, their features and analysis. Applications.
5. Characteristics and description of radio channel: noise, fading.
6. Terrestrial radio communication systems.
7. Satellite radio communication systems.
8. The cellular system concept.
9. Cell cluster, frequency reuse.
10. First generation cellular systems.
11. Digital cellular systems, their architecture and services.
12. The GSM cellular system.
13. The equipment of base stations, and mobile terminals.
14. Elements of the cellular network architecture.
15. Voice and data transmission in the GSM.
16. The HSCSD, the GPRS and the EDGE high speed data subsystems.
17. Physical and logical channels in GSM.
18. Principles of operation and organisation of trunked radio systems.
19. Characteristics and applications of trunked radio systems.
20. The TETRA trunked radio system.
21. Digital wireless telephony systems.
22. The DECT system.
23. The UMTS, 3rd generation cellular system.
24. Architecture of the UMTS system.
25. The IEEE802.15.1 Bluetooth wireless data transmission standard.
26. The IEEE802.15.4 ZigBee wireless data transmission standard.
27. The IEEE802.16 WIMAX wireless data transmission standard.
28. The IEEE802.11 wireless local area network standard.
29. Technical solutions used in modern radio communication systems.
30. Software defined radio.</td></tr>
<tr><td>Prerequisites and co-requisites</td><td>No requirements</td></tr>
<tr><td>Assessment methods and criteria</td><td><table><tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr><tr><td>Written exam</td><td>51.0%</td><td>100.0%</td></tr></table></td></tr>
<tr><td>Recommended reading</td><td><table><tr><td>Basic literature</td><td>K. Wesołowski Systemy radiokomunikacji ruchomej WKŁ Warszawa</td></tr><tr><td>Supplementary literature</td><td>R. Zienkiewicz Telefony komórkowe GSM i DCS WKŁ Warszawa</td></tr><tr><td>eResources addresses</td><td></td></tr></table></td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td></td></tr>
<tr><td>Practical activites within the subject</td><td>Not applicable</td></tr>
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