GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Reception of Radio Signals, PG_00064010
Field of study	Electronics and Telecommunications

Date of commencement of studies	February 2026	Academic year of realisation of subject	2025/2026
Education level	second-cycle studies	Subject group	Optional subject group Specialty 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	1	Language of instruction	Polish
Semester of study	1	ECTS credits	3.0
Learning profile	general academic profile	Assessment form	exam

Conducting unit	Department Of Radiocommunication Systems And Networks -> Faculty Of Electronics Telecommunications And Informatics -> Wydziały Politechniki Gdańskiej
Name and surname of lecturer (lecturers)	Subject supervisor — prof. dr hab. inż. Jacek Stefański Teachers — dr hab. inż. Jarosław Sadowski; prof. dr hab. inż. Jacek Stefański

Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	15.0	0.0	15.0	0.0	45
	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	45	5.0	25.0	75

Subject objectives	Acquaint students in detail with construction and operation of a modern radio communications receiver

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[K7_U12] is able, to an increased extent, to analyze the operation of components and systems related to the field of study, as well as to measure their parameters and study their technical characteristics, and to plan and carry out experiments related to the field of study, including computer simulations, interpret the obtained results and draw conclusions	The student can formulate the radio link budget and explain the influence of the receiver parameters on this budget. The student solves simple tasks on the receiver's noise ratio, can explain the causes and effects of intermodulation distortion in the receiver.	[SU4] Assessment of ability to use methods and tools
	[K7_K02] is ready to provide critical evaluation of received content and to acknowledge the importance of knowledge in solving cognitive and practical problems	The student knows and can use specialized vocabulary in the field of modern radio communication.	[SK4] Assessment of communication skills, including language correctness
	[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	The student knows the basic elements of the theory of radio reception with particular emphasis on digital systems and knows the reception techniques used in modern cellular systems.	[SW1] Assessment of factual knowledge

Subject contents	1. Who invented radio ? 2. Digital and Analog Radio Communication System 3. Block Diagram of Radio Communication System 4. Shannon Theory 5. Radio Link Budget 6. Criteria of Speech and Data Signals Reception 7. Basic Parameters of Receiver 8. Noise of Receiver 9. Noise Figure and Noise Temperature. 10. Analog Receiver Scheme 11. Digital Receiver Scheme 12. Dynamic Range in Digital Receiver 13. Optimal Reception of Digital Signals in Gaussian Channel 14. Signal Reception Techniques for 2G Systems 15. Signal Reception Techniques for 3G Systems 16. Signal Reception Techniques for 4G and 5G Systems		
Prerequisites and co-requisites	No requirements		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Implementation of project tasks	50.0%	30.0%
	Written exam (lecture + practice)	50.0%	70.0%
Recommended reading	Basic literature	1. Tomasi W., Advanced Electronic Communications Systems, Prentice Hall, Sixth Edition, 2014. 2. Drentea C., Modern Communications Receiver Design and Technology, Artech House, 2010. 3. Fazel K., Kaiser S., Multi-Carrier and Spread Spectrum Systems. From OFDM and MC-CDMA to LTE and WiMAX, 2nd Edition, Wiley & Sons, 2008. 4. Schaub K. B., Kelly J., Production Testing of RF and System-on-a-Chip Device for Wireless Communications, Artech House, 2004. 5. Proakis J. G., Digital Communications, McGraw-Hill, 1989. 6. Mitola J., Software Radio Architecture, John Wiley & Sons, 2000.	
	Supplementary literature	No requirements	
	eResources addresses	Adresy na platformie eNauczanie:	
Example issues/ example questions/ tasks being completed			
Work placement	Not applicable		

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