GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Reception of Radio Signals I, PG_00047459		
Field of study	Electronics and Telecommunications		
Date of commencement of studies	October 2023	Academic year of realisation of subject	2023/2024
Education level	second-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	1	Language of instruction	Polish
Semester of study	2	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	prof. dr hab. inż. Jacek Stefański	
	Teachers	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	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	4.0	16.0	50

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_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_U06] can analyse the operation of components, circuits and systems related to the field of study; measure their parameters; examine technical specifications; interpret 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_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
	Written examination	50.0%	70.0%
	Midterm colloquium	50.0%	30.0%
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: Technika odbioru radiowego (Reception of Radio Signals) - 2023/2024 - Moodle ID: 16671 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=16671	
Example issues/ example questions/ tasks being completed			
Work placement	Not applicable		