GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Integrated Transceiver Devices, PG_00064030		
Field of study	Electronics and Telecommunications, Hydrogen Technologies and Electromobility		
Date of commencement of studies	February 2026	Academic year of realisation of subject	2026/2027
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	2	ECTS credits	2.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Department of Microelectronic Systems -> Faculty of Electronics Telecommunications and Informatics -> Faculties of Gdańsk University of Technology		
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Grzegorz Blakiewicz	
	Teachers	dr hab. inż. Grzegorz Blakiewicz	

Lesson types

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	15.0	0.0	15.0	0.0	0.0	30

E-learning hours included: 0.0

eNauczanie source addresses:

Moodle ID: 7400 Scalone urządzenia nadawczo-odbiorcze zima 26/27
https://enauczanie.pg.edu.pl/2025/course/view.php?id=7400

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	3.0	17.0	50

Subject objectives

Gain knowledge of design of main functional blocks of integrated receivers and transmitters for wireless communication. Practice designing and verifying the parameters of functional blocks using a computer simulator.

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 has gained knowledge of properties of selected functional blocks of transceivers and receivers, which allows him to select appropriate solution for the assumed requirements.	[SK2] Assessment of progress of work
[K7_U01] can apply mathematical knowledge to formulate and solve complex and non-typical problems related to the field of study by: - appropriate selection of source information and its critical analysis, synthesis, creative interpretation and presentation, - application of appropriate methods and tools	The student can design and carry out verification simulations of basic functional blocks of transmitters and receivers.	[SU1] Assessment of task fulfilment
[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 has gained knowledge of type and design of basic functional blocks of transmitters and receivers.	[SW1] Assessment of factual knowledge

<table>
<tr><td>Subject contents</td><td>Course content – lecture
1. Characteristics of wireless communication systems
2. Receiver architectures in integrated wireless communication systems
3. Transmitter architectures in integrated wireless communication systems
4. Parameters and characteristics of functional blocks in the signal path
5. Specifics of design of integrated circuits operating at high frequencies
6. Integrated high-frequency low-noise amplifiers
7. Frequency conversion circuits
8. Integrated mixers of high-frequency signals
9. Phase loops
10. High-frequency voltage-controlled oscillators
11. Phase detectors and programmable frequency dividers
12. Intermediate frequency and baseband filters
13. Realizations of integrated intermediate frequency filters
14. Realizations of integrated baseband filters
15. Analog-to-digital and digital-to-analog converters used in communications equipment</td></tr>
<tr><td>Prerequisites and co-requisites</td><td>Basic knowledge of the principle of operation and design of basic analog functional blocks such as, amplifiers, filters, multipliers.</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>End-of-semester colloquium</td><td>50.0%</td><td>70.0%</td></tr>
<tr><td>Laboratory exercises</td><td>50.0%</td><td>30.0%</td></tr>
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<tr><td>Recommended reading</td><td><table>
<tr><td>Basic literature</td><td>A. Abidi, P. Gray, R. Meyer, "Integrated Circuits for Wireless Communications" New York 1999</td></tr>
<tr><td>Supplementary literature</td><td>R. Ludwig, P. Bretchko, RF circuit design, teory and applications, Prentice Hall, New Jersey, 2000</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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