GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Software Defined Radio Technique, PG_00048369
Field of study	Electronics and Telecommunications

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**	English
Semester of study	2	**ECTS credits**	1.0
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	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	15.0	0.0	0.0	0.0	0.0	15
	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	15	2.0	8.0	25

Subject objectives	Students learn software defined radio technology.

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[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 and understands the role of individual blocks in the radio transmitter and receiver implemented in software defined radio technology.	[SW1] Assessment of factual knowledge
	[K7_W04] knows and understands, to an increased extent, the principles, methods and techniques of programming and the principles of computer software development or programming devices or controllers using microprocessors or other elements or programmable devices specific to the field of study, and organization of work of systems using computers or such devices	The student knows and understands programming techniques and principles of software development for devices implemented in software defined radio technology.	[SW1] Assessment of factual knowledge

Subject contents	1. Concept of Software Defined Radio (SDR) technology. 2. Construction of SDR transceiver. 3. The technical requirements for SDR receiver. 4. The technical requirements for SDR transmitter. 5. The SDR hardware platforms architecture. 6. Structure and properties of the SDR hardware platforms. 7. Signal processing in the SDR hardware platforms. 8. Concept of Software Communications Architecture (SCA). 9. Properties of the SCA. 10. Structure and properties of the radio system compatible with the SCA architecture. 11. An example of software that is compatible with the SCA architecture. 12. Software tools supporting the implementation of the radio interface in the SDR technology. 13. Example of the SDR radio transceiver implementation using the available tools. 14. Example of a digital radio communication system transceiver implementation in the SDR technology. 15. Examples of commercial use of devices implemented in the SDR technology .
Prerequisites and co-requisites	

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Written exam	50.0%	100.0%

Recommended reading	Basic literature	Burns, Software Defined Radio for 3G, Artech House, 2003
		Grayver, Implementing Software Defined Radio, Springer, 2013
		Tuttlebee, Software Defined Radio Enabling Technologies, John Wiley & Sons Ltd, 2002
	Supplementary literature	Reed, Software Radio: A Modern Approach to Radio Engineering, Prentice Hall PTR, 2002
	eResources addresses	Adresy na platformie eNauczanie:

Example issues/ example questions/ tasks being completed	
Work placement	Not applicable

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