



## Subject card

Subject name and code	Software Defined Radio Technique, PG_00047476						
Field of study	Electronics and Telecommunications						
Date of commencement of studies	February 2022	Academic year of realisation of subject			2022/2023		
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			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						
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 advanced extent, the principles, methods and techniques of programming and the principles of computer software development or programming devices or controllers using microprocessors or programmable elements or systems specific to the field of study, and organisation 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	<ol style="list-style-type: none"> <li>1. Concept of Software Defined Radio (SDR) technology.</li> <li>2. Construction of SDR transceiver.</li> <li>3. The technical requirements for SDR receiver.</li> <li>4. The technical requirements for SDR transmitter.</li> <li>5. The SDR hardware platforms architecture.</li> <li>6. Structure and properties of the SDR hardware platforms.</li> <li>7. Signal processing in the SDR hardware platforms.</li> <li>8. Concept of Software Communications Architecture (SCA).</li> <li>9. Properties of the SCA.</li> <li>10. Structure and properties of the radio system compatible with the SCA architecture.</li> <li>11. An example of software that is compatible with the SCA architecture.</li> <li>12. Software tools supporting the implementation of the radio interface in the SDR technology.</li> <li>13. Example of the SDR radio transceiver implementation using the available tools.</li> <li>14. Example of a digital radio communication system transceiver implementation in the SDR technology.</li> <li>15. Examples of commercial use of devices implemented in the SDR technology .</li> </ol>		
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		
Example issues/ example questions/ tasks being completed			
Work placement	Not applicable		