



Subject card

Subject name and code	Data Security in Radio Communication Systems, PG_00047470						
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			English		
Semester of study	2	ECTS credits			2.0		
Learning profile	general academic profile	Assessment form			assessment		
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	15.0	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	The aim of the course is to teach students the cryptographic security methods in radiocommunication systems.						
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 is able to choose the right methods of data protection for appropriate applications.		[SK5] Assessment of ability to solve problems that arise in practice		
	[K7_U07] can apply advanced methods of process and function support, specific to the field of study		The student is able to use the acquired knowledge of cryptographic data protection methods to understand the methods of data protection used in radio communication systems.		[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 knows and understands the role of individual blocks in the diagrams depicting the method of data security in radio communication systems.		[SW1] Assessment of factual knowledge		

Subject contents	<ol style="list-style-type: none"> 1. Basic ideas and targets of data security. 2. Block ciphers (DES, AES, Kasumi). 3. Stream ciphers, stream cipher's keys generation. 4. Asymmetric ciphers. 5. Message Authentication Codes (MAC). 6. Threats for data security in radio communication systems. 7. Authentication and ciphering in radio communication systems. 8. Transmission security in TETRA trunked radio system. 9. Transmission security in CDMA2000 networks. 10. Transmission security in GSM. 11. Transmission security in UMTS. 12. Transmission security in IEEE802.11. 13. Mechanisms of security in Bluetooth. 14. Mechanisms of security in WIMAX. 15. Software Defined Radio – data security aspects 			
Prerequisites and co-requisites				
Assessment methods and criteria	Subject passing criteria		Passing threshold	Percentage of the final grade
	Written exam		51.0%	90.0%
	Practical exercise		50.0%	10.0%
Recommended reading	Basic literature		<p>V.Niemi, K.Nyberg: UMTS Security, John Wiley & Sons Inc.</p> <p>B. Preneel "Mobile and Wireless Communications Security" In <i>NATO ASI on Aspects of Network and Information Security</i>, IOS Press</p> <p>P. Chandra "Bulletproof Wireless Security GSM, UMTS, 802.11 and Ad Hoc Security", Elsevier Inc 2005</p>	
	Supplementary literature		Roger J. Sutton: Secure Communications: Applications and Management, John Wiley & Sons Inc.	
	eResources addresses		Adresy na platformie eNauczenie: Bezpieczeństwo danych w systemach radiokomunikacyjnych - 2023/24 - Moodle ID: 37897 https://enauczenie.pg.edu.pl/moodle/course/view.php?id=37897	
Example issues/ example questions/ tasks being completed				
Work placement	Not applicable			