



## Subject card

Subject name and code	Radio Communication Equipment, PG_00048145						
Field of study	Electronics and Telecommunications						
Date of commencement of studies	October 2020		Academic year of realisation of subject		2023/2024		
Education level	first-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	4		Language of instruction		Polish		
Semester of study	7		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		prof. dr hab. inż. Jacek Stefański				
	Teachers		prof. dr hab. inż. Jacek Stefański  dr inż. Małgorzata Gajewska  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		2.0		18.0	50
Subject objectives	To familiarize students with basic construction and operation of radio communication devices.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K6_W34] Knows the characteristics of telecommunications channels, methods of securing information, modulation systems, methods of access to the channel.		The student knows the construction of selected radio communication devices, solutions of selected functional units of the modern transmitter and receiver as well as development trends in the design of these devices.		[SW1] Assessment of factual knowledge		
	[K6_U06] can analyse the operation of components, circuits and systems related to the field of study, measure their parameters and examine technical specifications		The student knows the constructions, measuring techniques and parameters of transceivers used in radiocommunication.		[SU3] Assessment of ability to use knowledge gained from the subject		
Subject contents	1. Radio emissions notation 2. Block diagram of a radiocommunication transmitter 3. Block diagram of a radiocommunication receiver 4. Frequency synthesizer (basic parameters, classification) 5. Basic synthesizer circuits 6. Digital frequency synthesizer 7. Receiver HF module, mixer 8. Intermediate frequency circuit and receivers selectivity 9. Transmitter structure and basic parameters 10. Digital baseband transmission: source and channel encoding 11. Interleaving and modulation techniques for digital radiocommunication transmitter 12. Transmitter HF module: power amplifier, classification, parameters and basic circuits. Matched circuits. Diplexers and duplexers 13. Examples of radiocommunication equipment: GSM mobile terminal, TETRA mobile terminal 14. Software defined radio (SDR) concept of a hardware platform 15. Software platform for SDR technique						
Prerequisites and co-requisites	No requirements						
Assessment methods and criteria	Subject passing criteria		Passing threshold		Percentage of the final grade		
	Midterm colloquium		50.0%		70.0%		
	Practical exercise		50.0%		30.0%		

Recommended reading	Basic literature	1. Mitola J., Software Radio Architecture, Object-Oriented Approaches to Wireless Systems Engineering, John Wiley & Sons, Inc., 2000. 2. Bogdan T., Urządzenia radiowe, WSP, Warszawa 1991. 3. Lenkowski J., Technika odbioru radiowego, WNT, Warszawa 1970.
	Supplementary literature	No requirements
	eResources addresses	Adresy na platformie eNauczenie: Urządzenia radiokomunikacyjne - 2023/2024 - Moodle ID: 27945 <a href="https://enauczenie.pg.edu.pl/moodle/course/view.php?id=27945">https://enauczenie.pg.edu.pl/moodle/course/view.php?id=27945</a>
Example issues/ example questions/ tasks being completed	No issues / questions.	
Work placement	Not applicable	