GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Wireless Technology in Automatic Control, PG_00047621		
Field of study	Automatic Control, Cybernetics and Robotics		
Date of commencement of studies	October 2025	Academic year of realisation of subject	2027/2028
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	3	Language of instruction	Polish
Semester of study	6	ECTS credits	3.0
Learning profile	general academic profile	Assessment form	assessment
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. Krzysztof Cwalina	
	Teachers	dr inż. Krzysztof Cwalina	

Lesson types and methods of instruction

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	30.0	0.0	15.0	0.0	0.0	45

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	45	3.0	27.0	75

Subject objectives

Radio link structure and operation, typical applications for automatics.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_W01] knows and understands, to an advanced extent, mathematics necessary to formulate and solve simple issues related to the field of study	The student learned the basics of radio communication theory and technique as well as the main functional conditions in the field of wireless communication development.	[SW3] Assessment of knowledge contained in written work and projects

Subject contents

1. Introduction to wireless communications, functional scheme of a radio-link, short description of a radio-wave phenomena 2. Basic energetic descrition of the radio link, surface power density and electric field intensity of the radio wave 3. Radio transmitter equipment, functional scheme, exploitation characteristics 4. Radio reciver equipment, functional scheme, exploitation characteristics 5. Antenna equipement as frequency-space filter, impedance and directivity properties, exploitation parameters 6. Main antenna solutions, wip and halfwave dipole antennas, impedance and directivity properties 7. Basic radiowave propagation conditions, fee and effective propagation space, LOS and NLOS conditions 8. Main range conditions, desirable and undesirable range 9. One and tqo directional work of radio link, simple and dupleks kind of the work, radio network schemes, cellular strucutre of the network practical solutions 10. Frequency spectrum management, coordination distance, cellular cluster, role of the Electonic Communications Office (UKE) 11. Basic principles of the modulation technique, digital modulations, exploitation properties 12. Digital form of a radio link, general functional scheme, exploitation properties 13. Radio access basic protocol layer characteristics, protocols of ??? 14. Main standards of wireless solutions foe remote steering and control applications 15. Final exam

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%
Activity	0.0%	15.0%
Practical exercise	50.0%	15.0%

Recommended reading

Basic literature	Katulski R.J.: Propagacja fal radiowych w telekomunikacji bezprzewodowej, WKŁ, 2009
Supplementary literature	No requirements
eResources addresses	Adresy na platformie eNauczanie:

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

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