



Subject card

Subject name and code	Data Communications Technologies, PG_00069145						
Field of study	Electrical Engineering, Automation, Robotics and Control Systems						
Date of commencement of studies	February 2025		Academic year of realisation of subject		2025/2026		
Education level	second-cycle studies		Subject group				
Mode of study	Full-time studies		Mode of delivery		at the university		
Year of study	1		Language of instruction		Polish		
Semester of study	2		ECTS credits		3.0		
Learning profile	general academic profile		Assessment form		assessment		
Conducting unit	Department of Electrified Transportation -> Faculty of Electrical and Control Engineering -> Wydział Politechniki Gdańskiej						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Aleksander Jakubowski				
	Teachers						
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		5.0		25.0	75
Subject objectives	The student learns about data communications, with particular emphasis on its applications in electromobility. Acquires skills in data acquisition, conversion and transmission. Configures network connections using typical data transmission standards. Acquires skills in autonomous electric vehicle software and autonomous driving functions. Is able to analyze geolocation data. Assesses the security of network communications and applies adequate security measures.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K7_W01] has an extended and deepened knowledge of mathematics, including selected issues of numerical methods and knowledge useful for solving tasks in the field of electrotechnology and electrodynamics, has a general knowledge of technical sciences covering their fundamentals and applications		Has knowledge of information acquisition, processing and transmission. Has knowledge of ICT system applications in electromobility.		[SW1] Assessment of factual knowledge		
	[K7_U02] is able to prepare and deliver a short oral presentation on a selected technical topic		Is able to conduct a discussion on the measurement and/or programming activities carried out and the correctness of their results.		[SU1] Assessment of task fulfilment		
	[K7_U03] is able to obtain information from literature, databases and other sources, also in English, draw conclusions, formulate and fully justify opinions. substantiate opinions; is able to identify directions for further learning and implement the process of self-education		Is able to obtain and analyze technical documentation for equipment and/or software. Is able to use a database of publications.		[SU2] Assessment of ability to analyse information		

Subject contents	LECTURE: Data communications and telecommunications. Transmission media. Information acquisition and storage systems. Big data. ICT security. Track-to-vehicle communication systems in railroad traffic control. Unmanned rail vehicles. Safety systems in road vehicles. Road traffic control. Autonomy in road transportation. Geolocation systems, satellite communications. LABORATORY: Data communication networks. Processing of satellite geolocation system data. Analog-to-digital conversion and remote acquisition of signals. Communication and control of a mobile robot. Distributed control of traffic signals. Basics of encryption and decryption of information. Windows built-in functions. Command line.		
Prerequisites and co-requisites	Basic knowledge of computer science and digital signal processing.		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Quiz during semester	50.0%	60.0%
	Laboratory activities report	50.0%	40.0%
Recommended reading	Basic literature	Bradford R.: Podstawy sieci komputerowych. Warszawa: WKŁ, 2009. Fryškowski B., Grzejszczyk E.: Systemy transmisji danych. Warszawa: WKŁ, 2010. Haykin S.: Systemy telekomunikacyjne, t. 1 i 2. Warszawa: WKŁ, 2004. Norris M. Teleinformatyka. Warszawa: WKiŁ, 2013.	
	Supplementary literature	Bosch : Sieci wymiany danych w pojazdach samochodowych. Warszawa, WKiŁ, 2008. Januszewski J.: Systemy satelitarne GPS GALILEO i inne. Wydawnictwo Naukowe PWN, Warszawa 2010. Hungerford T. W. Algebra. Springer-Verlag, 1974.	
	eResources addresses		
Example issues/ example questions/ tasks being completed	Record and interpret the selected CAN interface data frame. Configure a remote analog signal measurement system with wireless data transmission. Analyze and modify selected data encryption algorithms. Provide basic definitions of ICT.		
Work placement	Not applicable		

Document generated electronically. Does not require a seal or signature.