



Subject card

Subject name and code	Data Communications Technologies, PG_00044090						
Field of study	Electrical Engineering						
Date of commencement of studies	February 2023		Academic year of realisation of subject		2023/2024		
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		2.0		
Learning profile	general academic profile		Assessment form		assessment		
Conducting unit	Department of Electrical Engineering of Transport -> Faculty of Electrical and Control Engineering						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Aleksander Jakubowski				
	Teachers		dr hab. inż. Andrzej Wilk				
			dr inż. Aleksander Jakubowski				
			dr inż. Sławomir Judek				
			dr hab. inż. Jacek Skibicki				
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		5.0		15.0	50
Subject objectives	The student becomes familiar with the basic concepts of ICT with particular emphasis on development trends, especially in the area of electromobility. Has general knowledge enabling further self-study. Is able to interpret quantities related to ICT. He knows the details of the functionality of selected applications and data exchange interfaces. He has knowledge about functionality details of selected applications and data transmission standards.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	K7_W02		Student is able to use ICT technologies in measurement tasks.		[SW3] Assessment of knowledge contained in written work and projects		
	K7_U02		Student is able to discuss methodology and results of conducted measurement or programming tasks.		[SU1] Assessment of task fulfilment		
	K7_W01		Student has basic knowledge about industrial communication technologies, focusing on electromobility.		[SW1] Assessment of factual knowledge		
	K7_U03		Student is able to obtain and analyze technical documentations of software and hardware, and is able to utilize publications databases.		[SU2] Assessment of ability to analyse information		
Subject contents	LECTURE ICT - introduction, basic definitions, state of art, limitations, development trends. Track - vehicle communication systems in railway traffic control. Unmanned rail vehicles. Vehicle-vehicle and vehicle infrastructure communication. Internet applications in ICT. Big data. Cloud computing. Visual Analytics. LABORATORY Data communication buses. Data processing from GPS system. Analog-to-digital conversion and teletransmission of signal. Distributed traffic light control. Basics of encrypting and decrypting information. Embedded Windows features. Command-line interface						
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
	Midterm colloquium	50.0%	60.0%
	Report from laboratory exercises	50.0%	40.0%
Recommended reading	Basic literature	1. Bradford R.: Podstawy sieci komputerowych. Warszawa: WKŁ, 2009. 2. Fryśkowski B., Grzejszczyk E.: Systemy transmisji danych. Warszawa: WKŁ, 2010. 3. Haykin S.: Systemy telekomunikacyjne, t. 1 i 2. Warszawa: WKŁ, 2004. 4. Norris M. Teleinformatyka. Warszawa: WKiŁ, 2013.	
	Supplementary literature	1. Wilk A.: Aplikacje internetowe w teleinformatyce. (wyd. wewnętrzne) 2. Karwowski K.: Komunikacja pojazd-pojazd oraz pojazd infrastruktura. (wyd. wewnętrzne) 3. Skibicki J.: Układy komunikacji tor pojazd w sterowaniu ruchem kolejowym. Bezzałogowe pojazdy szynowe (wyd. wewnętrzne) 4. Judek S.: Duże zbiory danych. (wyd. wewnętrzne)	
	eResources addresses	Adresy na platformie eNauczanie: TECHNOLOGIE TELEINFORMATYCZNE [2023/24] - Moodle ID: 32219 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=32219	
Example issues/ example questions/ tasks being completed	<ul style="list-style-type: none">• Measure by oscilloscope and interpret the selected interface data frame.• Set up a remote analog signal measurement system with wireless data transmission.• Analyze and modify selected data encryption algorithms.• Present the basic definitions of ICT.		
Work placement	Not applicable		