



## 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	<ol style="list-style-type: none"> <li>Bradford R.: Podstawy sieci komputerowych. Warszawa: WKŁ, 2009.</li> <li>Fryśkowski B., Grzejszczyk E.: Systemy transmisji danych. Warszawa: WKŁ, 2010.</li> <li>Haykin S.: Systemy telekomunikacyjne, t. 1 i 2. Warszawa: WKŁ, 2004.</li> <li>Norris M. Teleinformatyka. Warszawa: WKiŁ, 2013.</li> </ol>	
	Supplementary literature	<ol style="list-style-type: none"> <li>Wilk A.: Aplikacje internetowe w teleinformatyce. (wyd. wewnętrzne)</li> <li>Karwowski K.: Komunikacja pojazd-pojazd oraz pojazd infrastruktura. (wyd. wewnętrzne)</li> <li>Skibicki J.: Układy komunikacji tor pojazd w sterowaniu ruchem kolejowym. Bezzałogowe pojazdy szynowe (wyd. wewnętrzne)</li> <li>Judek S.: Duże zbiory danych. (wyd. wewnętrzne)</li> </ol>	
	eResources addresses	Adresy na platformie eNauczanie: TECHNOLOGIE TELEINFORMATYCZNE [2023/24] - Moodle ID: 32219 <a href="https://enauczanie.pg.edu.pl/moodle/course/view.php?id=32219">https://enauczanie.pg.edu.pl/moodle/course/view.php?id=32219</a>	
Example issues/ example questions/ tasks being completed	<ul style="list-style-type: none"> <li>Measure by oscilloscope and interpret the selected interface data frame.</li> <li>Set up a remote analog signal measurement system with wireless data transmission.</li> <li>Analyze and modify selected data encryption algorithms.</li> <li>Present the basic definitions of ICT.</li> </ul>		
Work placement	Not applicable		