GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Data Communications Technologies, PG_00044090		
Field of study	Electrical Engineering		
Date of commencement of studies	February 2024	Academic year of realisation of subject	2024/2025
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		

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_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
K7_W01	Student has basic knowledge about industrial communication technologies, focusing on electromobility.	[SW1] Assessment of factual knowledge
K7_U02	Student is able to discuss methodology and results of conducted measurement or programming tasks.	[SU1] Assessment of task fulfilment
K7_W02	Student is able to use ICT technologies in measurement tasks.	[SW3] Assessment of knowledge contained in written work and projects

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
Report from laboratory exercises	50.0%	40.0%
Midterm colloquium	50.0%	60.0%

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:
Example issues/ example questions/ tasks being completed	• 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	