GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Interfaces and communication networks, PG_00062753		
Field of study	Technologies for Industry 5.0		
Date of commencement of studies	October 2026	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	2	Language of instruction	Polish
Semester of study	4	ECTS credits	2.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Department of Biomedical Engineering -> Faculty of Electronics Telecommunications and Informatics -> Faculties of Gdańsk University of Technology		
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Grzegorz Jasiński	
	Teachers		

Lesson types

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	2.0	18.0	50

Subject objectives

The aim of the subject is for students to acquire knowledge and skills related to the use of typical communication interfaces in data acquisition. Students should learn to configure, physically connect and test the operation of selected wired and wireless communication standards.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_W05] demonstrates practical knowledge related to technological processes, utilized devices and systems, has knowledge regarding selected processes monitoring tools	The student explains the meaning of basic concepts related to topology and functioning of interfaces. The student explains the basic differences between different interfaces. The student will identify and explain the basic considerations for the design and use of data acquisition systems. The student selects data acquisition systems depending on the application.	[SW3] Assessment of knowledge contained in written work and projects [SW1] Assessment of factual knowledge
[K6_U05] interprets phenomena occurring around the technological process and processes occurring in the life cycle of devices and systems, makes a critical assessment of the functioning of existing solutions	The student tests the operation of selected data exchange interfaces. The student builds and configures selected data acquisition and exchange systems.	[SU3] Assessment of ability to use knowledge gained from the subject [SU2] Assessment of ability to analyse information

Subject contents

Course content – lecture
Concept of interface and communication protocol. Types of interfaces. Basic concepts of data transmission. Computer networks, Layered network architectures. Data link layer design problems (synchronisation, flow control, error detection). Ethernet networks. RS232, RS485, CAN and 1-Wire serial interfaces. GPIB parallel interface. SCPI, Modbus communication protocols. Bluetooth and Zigbee wireless interfaces.

Prerequisites and co-requisites

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Laboratory practical exercises	50.0%	30.0%
Written test	50.0%	70.0%

Recommended reading	Basic literature	1. Michael Gook Interfejsy sprzętowe komputerów PC Helion 2005 2. Nawrocki W. Komputerowe systemy pomiarowe WKiŁ 2002 3. Waldemar Nawrocki, Rozproszone Systemy Pomiarowe, Wydawnictwa Komunikacji i Łączności, Warszawa, 2006 4. Winiecki W. Organizacja mikrokomputerowych systemów pomiarowych, Oficyna Wydawnicza Politechniki Warszawskiej 1997 5. Wojciech Mielczarek, Szeregowe interfejsy cyfrowe, Wydawnictwo Helion, 1994
	Supplementary literature	1. Brent A. Miller, Chatschik Bisdikian, Bluetooth, Wydawnictwo Helion, 2003 2. Jacek Bogusz, Lokalne interfejsy szeregowe, Wydawnictwo BTC, 2004
	eResources addresses	
Example issues/ example questions/ tasks being completed	Analyse the user manual of the chosen measuring instrument to identify the elements relevant to the configuration and implementation of digital communication. Connecting the selected measuring instrument to a computer and testing the communication using the correct software tools.	
Practical activites within the subject	Not applicable	

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