

。 GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Interfaces of Electronic Systems, PG_00048080								
Field of study	Electronics and Telecommunications								
Date of commencement of studies	October 2022		Academic year of realisation of subject			2024/2025			
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	3		Language of instruction			Polish			
Semester of study	6		ECTS credits			2.0			
Learning profile	general academic profile		Assessment form			assessment			
Conducting unit	Department of Metrology and Optoelectronics -> Faculty of Electronics, Telecommunications and Informatics								
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Gı	b. inż. Grzegorz Lentka						
	Teachers		mgr inż. Dariusz Palmowski						
		dr hab. inż. Grzegorz Lentka							
Lesson types and methods	Lesson type	Lecture	Tutorial	Laboratory	Projec	t	Seminar	SUM	
of instruction	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 classes includ plan	didactic Participation in d in study consultation hours		Self-study		SUM		
	Number of study hours	30		2.0		18.0		50	
Subject objectives	Getting familar with categories and topologies of intefaces, inteface model based on interface and device functions. Description of the examples of popular interfaces. Pratice with configuring, programming and diagnostics of the common interfaces.								
Learning outcomes	Course outcome		Subject outcome			Method of verification			
	[K6_U04] can apply knowledge of programming methods and techniques as well as select and apply appropriate programming methods and tools in computer software development or programming devices or controllers using microprocessors or programmable elements or systems specific to the field of study		Organises system on the basis of the selected interfaces. Connects hardware layer and selects drivers and protocol. Uses methods and devices for conversion of interfaces and protocols.			[SU4] Assessment of ability to use methods and tools			
	[K6_W04] knows and understands, to an advanced extent, the principles, methods and techniques of programming and the principles of computer software development or programming devices or controllers using microprocessors or programmable elements or systems specific to the field of study, and organisation of systems using computers or such devices		Student explains paradigms of electronic systems construction. Classifies intefaces as buss, star or loop configuration and presents their properties. Interprets inteface model based on interface function, interface messages, device functions and device messages on the example of GPIB. Explains generalized protocol of asynchronous transfer negotiation (handshake).			ISWIJ Assessment of factual knowledge			

Subject contents	 Introduction: course outline, course grading, references. 2. Characteristic of electronic systems. The need of the interface in system. 3. Paradigms of electronic systems construction: modularity, hierarchiety, structuralism, connectivity 4. Topologies of the systems: star, loop, bus. 5. System classification based on scale: microsystem (SoC), classical systems (IaC, laboratory, industrial), distributed systems 6. Interface model based on interface functions, interface messages, device functions and device messages on the example of GPIB 7. Asynchronous interface system: bus, single-line interface messages 8. Set of interface functions as a functional description of the interface. GPIB functions set. 9. Generalized protocol of asynchronous transfer negotiation. Transmission of interface and device messages (3-wire handshake). 10. Multi-line interface messages on GPIB, basic control procedures. 11. Connecting hardware interface to software layers on the example of IEEE-488.2 and SCPI. 12. Autonomous interfaces in embedded controllers. 13. Microinterfaces similar to SMI (SPI, Microwire, etc.) Communication protocol used. 14. I2C interface and implementations. 15. RS-family of interfaces application in development and diagnostics of systems. 16. CAN interface mode model. 17. CAN interface basic protocol, distributed network construction. LIN subsystem. 18. Review of industry standards: EIB, Profibus, DeviceNet, J1850. 19. Review of computer interfaces: USB, FireWire. 20. Integration of interface systems. Hardware and software converters of interfaces. Expanders. 						
Prerequisites and co-requisites	No requirements						
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade				
	Lab exercises	50.0%	30.0%				
	Tests during semester	40.0%	60.0%				
	Activity (eNauczanie tasks)	0.0%	10.0%				
Recommended reading	Basic literature	 J. Bogusz: Lokalne interfejsy szeregowe w systemach cyfrowych, BTC 2004 2. W. Mielczarek: Szeregowe interfejsy cyfrowe, Helion 1994 W. Mielczarek: USB uniwersalny interfejs szeregowy, Helion 2005 4. W. Nawrocki: Komputerowe systemy pomiarowe, WKiŁ 2006 					
	Supplementary literature No requirements						
	eResources addresses	Adresy na platformie eNauczanie:					
		Interfejsy Systemów Elektronicznych 2024/2025 - Moodle ID: 42442 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=42442					
Example issues/ example questions/ tasks being completed							
Work placement	Not applicable						

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