



Subject card

Subject name and code	Protocols of Data Exchange in Systems, PG_00047862						
Field of study	Biomedical Engineering						
Date of commencement of studies	October 2023	Academic year of realisation of subject			2025/2026		
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			3.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	Department of Biomedical Engineering -> Faculty of Electronics, Telecommunications and Informatics						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Grzegorz Jasiński				
	Teachers		dr inż. Grzegorz Jasiński				
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	15.0	15.0	0.0	45
	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	45		3.0		27.0	75
Subject objectives	The aim of the course is to familiarize students with typical and widely used protocols for data exchange. Will present the protocols used in medical, industrial, and test laboratory in computer networks. Much space is devoted to the practical use of selected protocols. Issues related to the development of software that communicates using the selected protocols will be presented.						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	[K6_W03] Knows and understands, to an advanced extent, the construction and operating principles of components and systems related to the field of study, including theories, methods and complex relationships between them and selected specific issues - appropriate for the curriculum	Student explains the meaning of basic concepts related to the use of communication protocols. Student explains the basic differences between individual protocols. Student indicates and explains the basic conditions for the design and use of data exchange protocols. The student selects data exchange protocols depending on the application. The student tests the operation of selected data exchange protocols. Student builds and configures selected data acquisition and exchange systems. Student creates software that uses popular protocols.			[SW1] Assessment of factual knowledge [SW2] Assessment of knowledge contained in presentation		
	[K6_U07] can apply methods of process and function support, specific to the field of study	Student explains the importance of basic concepts related to data acquisition. Selected student has test data acquisition systems. Student builds and configures the selected acquisition systems and data exchange. Student creates software data acquisition systems.			[SU2] Assessment of ability to analyse information [SK5] Assessment of ability to solve problems that arise in practice [SU4] Assessment of ability to use methods and tools		
Subject contents	Basic terms. Model of open data exchange systems ISO / OSI. Internet protocols - introduction. Internet protocols - implementation in Builder C + + and Java. HTTP protocol. Mail protocols, POP3 and SMTP. File Transfer Protocol. Medical protocol, ASTM1381. Modem protocol, Hayes commands. Measuring instruments protocols - introduction. SCPI. Modbus RTU/ASCII. Compression and data encryption. Methods of data security. Medical standards: HL7, ENV1064. Medical interfaces - overview and future trends. Exam.						

Prerequisites and co-requisites	No requirements		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Practical exercise	50.0%	20.0%
	Project	0.0%	40.0%
	Midterm colloquium	50.0%	35.0%
	DL course	50.0%	5.0%
Recommended reading	Basic literature	1. A. G. Blank TCP/IP podstawy Wydawnictwo MIKOM PWN 2005 2. E. Rusty Harold: JAVA Programowanie sieciowe, Wydawnictwo RM, Warszawa 3. G. Coulouris, J. Dollimore, T. Kindberg, Systemy rozproszone - podstawy i projektowanie, WNT Warszawa 1998. 4. H. Osterloh TCP/IP szkoła programowania Wydawnictwo HELION 2006 5. K S. Siyan, T. Parker TCP/IP Księga eksperta Wydanie II Helion 2002 6. Materiały do przedmiotu opracowane w formie edukacji na odległość 7. S. Orłowski C#. Tworzenie aplikacji sieciowych. 101 gotowych projektów Helion 2006 8. Skrypt z materiałami do przedmiotu 9. W. Mielczarek Urządzenia pomiarowe i systemy kompatybilne ze standardem SCPI Helion 2009	
	Supplementary literature	Materiały do przedmiotu opracowane w formie edukacji na odległość, dostęp: http://uno.biomed.gda.pl	
	eResources addresses	Adresy na platformie eNauczanie:	
Example issues/ example questions/ tasks being completed			
Work placement	Not applicable		