GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Network Programming, PG_00038329		
Field of study	Automation, Robotics and Control Systems		
Date of commencement of studies	October 2026	Academic year of realisation of subject	2027/2028
Education level	second-cycle studies	Subject group	Specialty subject group Subject group related to scientific research in the field of study
Mode of study	Part-time studies	Mode of delivery	at the university
Year of study	2	Language of instruction	Polish
Semester of study	3	ECTS credits	3.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Department of Electric Drives and Energy Conversion -> Faculty of Electrical and Control Engineering -> Faculties of Gdańsk University of Technology		
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Piotr Kołodziejek	
	Teachers		

Lesson types

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	10.0	0.0	10.0	0.0	0.0	20

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	20	9.0	46.0	75

Subject objectives

The aim of the course is acquisition of skills by the students in network protocols monitoring, network application programming in the client-server architecture in C++ and Java using selected operating systems and software development environments including multithreaded data transfer, prioritization of network service, network sockets interface, layers, ports, TCP / IP protocols and basics of the cryptographic algorithms.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K7_K02] can interact and work in a group assuming various roles and identify priorities for the achievement of a specific task	The student explains the sequences functions called in the application client and server to establish communication with the use of connection protocol with transmission control and no control transmission.	[SK5] Assessment of ability to solve problems that arise in practice
[K7_U12] can program and implement network applications with typical protocols	Student describes the layered model TCP / IP protocol stack, model client-server communication, creation support libraries network applications and defined classes, functions / methods and method their use.	[SU1] Assessment of task fulfilment
[K7_W02] has a structured knowledge of the application of information systems to improve the reliability, efficiency, speed and mobility of control and management systems	Can work in group taking different roles in it. The student explains phases of the network application project design.	[SW3] Assessment of knowledge contained in written work and projects

Subject contents

Course content – lecture
Definitions and issues of computer networks, transmission types, network topologies, network protocol stack, TCP / IP, network addressing, ports, network sockets interface, network configuration and diagnostics, client - server architecture communication, event programming, multithreaded data transmission programming, prioritization of network services, basic cryptographic algorithms, client-server application based network programming, web-browsert network programming

<table>
<tr><td>Prerequisites and co-requisites</td><td colspan="3">Basic knowledge on computer networks and C/C++ programming.</td></tr>
<tr><td>Assessment methods and criteria</td><td colspan="3"><table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>Lectures colloquium</td><td>50.0%</td><td>50.0%</td></tr>
<tr><td>Laboratory tasks and project</td><td>100.0%</td><td>50.0%</td></tr>
</table></td></tr>
<tr><td rowspan="3">Recommended reading</td><td>Basic literature</td><td colspan="2">1. Sosinsky Barrie: Sieci komputerowe - Biblia, Helion, 2011.
2. A. Sopala: Pisanie programów internetowych, Mikom, 2000.
3. A. Jones, J. Ohlund Programowanie sieciowe Microsoft Windows, RM, 2000.
4. Eckel Bruce, Thinking in Java,, IV edition
5. Beej's Guide to Network Programming Using Internet Sockets: http://beej.us/guide/bgnet/</td></tr>
<tr><td>Supplementary literature</td><td colspan="2">1. E. Harold Java: programowanie sieciowe, READ ME, 2001.</td></tr>
<tr><td>eResources addresses</td><td colspan="2"></td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td colspan="3">Event programming of client-server applications in a natural prototyping environment, application of connection and connectionless network sockets, design of a multi-threaded "server" application to support network communication with basic "client" applications and a web browser, design of a virtual measuring instrument for monitoring selected industrial processes.</td></tr>
<tr><td>Practical activites within the subject</td><td colspan="3">Not applicable</td></tr>
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