GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Computer Networks and Internet Technologies, PG_00038089						
Field of study	Automation, Robotics and Control Systems						
Date of commencement of studies	October 2026		Academic year of realisation of subject	2026/2027			
Education level	first-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	3.0			
Learning profile	general academic profile		Assessment form	assessment			
Conducting unit	Department of Intelligent and Decision Support Systems -> Faculty of Electrical and Control Engineering -> Faculties of Gdańsk University of Technology						
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Tomasz Rutkowski					
	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		3.0	42.0	75	
Subject objectives	The aim of the course is for the student to master the issues of computer networks and internet technologies. The student will learn the principles of computer networking based on the TCP/IP protocol stack. In addition, the student will master the ability to use HTML, CSS, PHP, and SQL languages to build dynamic web pages with database access.						

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_W09] has knowledge in the field of security of ICT systems and networks	Defines the importance of the TSL transport layer security protocol for establishing authenticated and encrypted connections between computers on the Internet. Defines the differences between the HTTP, HTTPS and S-HTTP protocols.	[SW1] Assessment of factual knowledge
[K6_U05] can use analytical and simulation methods to solve tasks in the field of automation and robotics and use various techniques to carry out engineering tasks related to automation and robotics devices and systems	Uses various methods for computer network diagnostics. Designs a dynamic website using HTML, CSS cascading style sheets, PHP language and MySQL database.	[SU4] Assessment of ability to use methods and tools [SU1] Assessment of task fulfilment [SU5] Assessment of ability to present the results of task
[K6_K02] can work in a group taking on different roles in it	Performs tasks as part of a group, analysing network traffic in DoS and DDoS attack cases.	[SK1] Assessment of group work skills [SK4] Assessment of communication skills, including language correctness
[K6_W06] knows the structure of computers and microprocessors and the tasks of operating systems, has basic knowledge of the basics of computer software, drivers, microprocessor technology, design of simple algorithms and the operation of information networks	Defines the components of a computer network (hardware and software). Uses basic tools for making and diagnosing Ethernet connection cables. Identifies the advantages and disadvantages of different transmission media. Explains the roles and functions of the different layers of the ISO/OSI reference model. Explains the functions of the ARP, IP, TCP, and UDP protocols. Describes the basic protocols of the application layer. Describes the operation of WLAN (WiFi). Uses HTML, CSS, PHP, SQL and the MySQL database to build dynamic web pages.	[SW1] Assessment of factual knowledge

Subject contents

Course content – lecture

LECTURE: Computer networks history and computer networking fundamentals. Types of computers networks (LAN, WAN, MAN). Types of LAN network topology. Transmissions media types and network cabling types. ISO/OSI reference model. Ethernet network. Role and functions of the network accessories. TCP/IP protocols family. IP addressing, static and dynamic addresses. Role and functions of the DNS and DHCP servers. Wireless network WLAN (WiFi). Application layer selected protocols (including: HTTP, FTP, SMPT, POP, TSL, SSH). Networking and network security. Client-server and peer-to-peer technologies. Introduction to HTML, CSS, PHP and SQL languages. The basics of database administration (MySQL).

Course content – laboratory

TRAINING LABORATORY: Wire and diagnosis of Ethernet cable basic types. The basic throughput testing methods for various transmissions media types. Creating, configuration and testing of small heterogeneous computer network. Domain owner identification. Datagram s route identification. The basics of IP network traffic analysis. Create simple connected web pages with HTML. Cascading style sheets CSS utilization in the project. Dynamic web pages construction with PHP and MySQL database.

Prerequisites and co-requisites

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Laboratory coursework (tests, reports, project)	60.0%	50.0%
Lecture test	60.0%	50.0%

Recommended reading

Basic literature	1) A. Józefiok. CCNP 350-401 ENCOR. Zaawansowane administrowanie siecią Cisco. Helion, 2022. 2) J. Kurose, K. Ross. Sieci komputerowe, Ujęcie całościowe. Helion, 2018. 3) T. Felke-Morris. Web Design z HTML5 i CSS3, technologie frontendowe od podstaw. Helion, 2020. 4) J. Duckett. PHP i MySQL. Aplikacje internetowe po stronie serwera. Helion, 2023.
Supplementary literature	1) J. FitzGerald, A. Dennis, A. Durcikova. Komunikowanie danych i zastosowanie sieci komputerowych w biznesie. Helion, 2020. 2) L.L. Svekis, M. van Putten, R. Percival. JavaScript od pierwszej linii kodu. Błyskawiczna nauka pisania gier, stron WWW i aplikacji internetowych. Helion, 2023.
eResources addresses	

Example issues/ example questions/ tasks being completed	[1] List and describe basics elements of computer networks. [2] Describe advantages and disadvantages of various transmissions media types. [3] Describe role and functions of particular layers in the ISO/OSI reference model. [4] Explain functions of the ARP, IP, TCP and UDP protocols. [5] List and describe basic protocols of the TCP/IP model application layer.
Practical activites within the subject	Not applicable

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