GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Teleinformatic networks, PG_00037345		
Field of study	Technical Physics		
Date of commencement of studies	October 2020	Academic year of realisation of subject	2022/2023
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	5	ECTS credits	4.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Zakład Fizyki Teoretycznej i Informatyki Kwantowej -> Instytut Fizyki i Informatyki Stosowanej -> Faculty of Applied Physics and Mathematics		
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Bartosz Reichel	
	Teachers	dr inż. Bartosz Reichel	

Lesson types and methods of instruction							
	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	30.0	0.0	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	10.0	45.0	100

Subject objectives	Acquainted with the basic methods of data transmission, division of ICT equipment. Layer model of the ISO / OSI network.

Learning outcomes

Course outcome	Subject outcome	Method of verification
K6_K01	Student is aware of his strengths and weaknesses	[SK5] Assessment of ability to solve problems that arise in practice
K6_U03	Understanding the operation of the network based on ISO / OSI model	[SU1] Assessment of task fulfilment
K6_U02	Implement of basic control sum	[SU2] Assessment of ability to analyse information

Subject contents	Laboratory 1) Implementation of algorithms: parity bit, modulo sum, CRC 2) The breakdown of the data on to packets, analysis of impact of the size of the header to the size of the package 3) Implementation of minimum spanning tree algorithms 4) Tracking and analysis of the network traffic Lectures: 1. Elements of data transmission Channel, signal, information and modulation: parameters and characteristics. Spectrum, bandwidth, Modulation rate, transmission speed, propagation rate. Synchronous and asynchronous transmission. Receiver synchronization and transmission coding. Error models in transmission channels, elementary error rate. Detection and correction codes. Parity bit and CRC. 2. LAN and WLAN Ethernet (IEEE 802.3): access rule for common medium, device addressing, technologies and parameters, structured cabling, devices (hub, switch). Fast- (IEEE 802.3u) and Gigabit Ethernet (IEEE 802.3 ab / z). Minimal spanning tree (STP). Other solutions: Token Ring and FDDI (IEEE 802.5): 3. Access network Access channels: V.24 (RS232), USB, V.21-V.92 modems, ISDN, ADSL and HDSL modems. Parameters and ranges of application. 4. MAN and WAN network Analog and digital connections: PDH and SDH telecommunications hierarchy. FrameRelay network: principle of operation, layered model, permanent and switched virtual connection, parameters and costs of application. ATM network: operating principle, layered model, logical channel and path, devices. Parameters and scope of application. 5. Protocols and services in ICT networks Protocol definition and protocol classification. Protocols in layered models. Ethernet II ARP ICMP IP TCP and UDP DNS HTTP MQTT 6. Security. Symmetric / asymmetric encryption. Weaknesses and strengths of selected solutions. Attack methods (e.g. Man in the Middle)
Prerequisites and co-requisites	No requirements
Assessment methods and criteria	Subject passing criteria: Project Passing threshold: 50.0% Percentage of the final grade: 100.0%
Recommended reading	Basic literature: D.E. Comer , Sieci komputerowe i intersieci, WNT, Warszawa, 2003 A. Sopala, Pisanie programów internetowych, Mikom, Warszawa, 2000 Supplementary literature: No requirements eResources addresses: Adresy na platformie eNauczanie:
Example issues/ example questions/ tasks being completed	
Work placement	Not applicable