Bialystok University of Technology

Field of study	Computer Science						Degree level and programme type	Engineer's degree full-time programme
Specialization/ diploma path	---						Study profile	academic
Course name	Computer Networks						Course code	FCS-00026
							Course type	obligatory

Forms and number of hours of tuition	L	C	LC	P	SW	FW	S	Semester	1
	30		30					No. of ECTS credits	6

Entry requirements	Algorithms and Data Structures (FCS-00020), Introduction to Linux (FCS-00057),
Course objectives	Familiarize students with the basic model of data transmission in computer networks and implementations of mechanisms defined in such a model. Presentation of the cross-section of issues relating to computer networks. Gaining knowledge about the problems in the operation of the network and its underlying causes. Knowledge of the principles of operation and use of the basic services available online. Ability to design and configure simple network including network services.
Course content	Lecture: Network classification. Data transmission model. The concept of a communication protocol. Encapsulating Data Units. Methods of bit transmission. Types and properties of the transmission medium. The concept of physical addressing. Types of concentrators and switches. Framing in Data Link Layer. Physical link access algorithms. Logical addressing and its implementation in IPv4 and IPv6 protocols. Routing mechanisms in IP networks. The general structure of the Internet. Internal and external routing protocols. DNS system: structure and principle of operation. Transport layer and its tasks. Selected application layer protocols. Other layered models. Introduction to wide area network technology. Network packet analysis. Fundamentals of computer network security. Lab: - network cable, - VLAN configuration, - network packet analyzer, - configuration of the client and DHCP server, - routing protocol configuration, - firewall configuration with NAT, port forwarding, address mapping, - web server configuration, - design and implementation of a computer network.
Teaching methods	informative lecture, lecture problem, laboratory exercises, project method,
Assessment method	Lectures - written test Labs - excersises in network and services configuration

Symbol of learning outcome	Learning outcomes	Reference to the learning outcomes for the field of study
LO1	correctly describes the process of data transmission in the network and identifies network mechanisms within the model	K_W08
LO2	knows basic network services and can configure them	K_U08
LO3	can set up a simple network with basic computer network services	K_U08 K_K03
LO4	knows the basic principles of network devices	K_W08 K_U08

Symbol of learning outcome	Methods of assessing the learning outcomes	Type of tuition during which the outcome is assessed
LO1	wirtten test	L
LO2	wirtten test, tasks, quiz	L, Lc
LO3	exercises in computer network design	Lc
LO4	wirtten test, tasks, quiz	L, Lc

Student workload (in hours)		No. of hours
Calculation	1 - Attendance at lectures - 15x2	30
	2 - Attendance at classes - 15x2	30
	3 - Preparation for laboratories -	10
	4 - Performance of projects tasks (with presentation) -	55
	5 - Participation in student-teacher sessions -	5
	6 - Preparation for the test -	15
	7 - Preparation for laboratories tests -	5
	TOTAL:	150

Quantitative indicators	HOURS	No. of ECTS credits
Student workload – activities that require direct teacher participation	65 (5)+(1)+(2)	2.6
Student workload – practical activities	100 (7)+(4)+(3)+(2)	4.0

Basic references	1. J.F. Kurose, Computer networking: a top-down approach, University of Massachusetts, Amherst (https://www.ucg.ac.me/skladiste/blog_44233/objava_64433/fajlovi/Computer%20Networking%20_%20A%20Top%20Down%20Approach,%207th,%20conv 2. Andrew Tanenbaum "Computer Networks", Prentice Hall, Indian International Ed.; 5th edition (https://www.mbit.edu.in/wp-content/uploads/2020/05/Computer-Networks-5th-Edition.pdf) 3. Douglas E. Comer "Computer Networks and Internets", Pearson; 6th edition, 2014 4. Netfilter documentation, http://www.netfilter.org 5. Mikrotik documentation, http::/www.mikrotik.com 6. Server DHCP, https://www.isc.org 7. Apache project, http://www.apache.org
Supplementary references	1. IEEE specifications 802.2, 802.3, 802.4, 802.5, 802.11: standards.ieee.org/getieee802/, 2. Request For Comments 3. Larry L. Peterson, Bruce S. Davie, "Computer Networks: A Systems Approach", 5th edition, Elsevier, 2012.

Organisational unit conducting the course	Department of Information Systems and Computer Networks	Date of issuing the programme
Author of the programme	dr inż. Andrzej Chmielewski	Feb. 17, 2022

L – lecture, C – classes, LC – laboratory classes, P – project, SW – specialization workshop, FW – field work,S – seminar