Institute of Cyber-physical Systems			Semester 4. of the curriculum 2023-24-2			
Name of the subject:	Code of the subject:	Credits:	Weekly hours:			
				lec	sem	lab
Network Technologies I.	NIXHT1CBNE	4	full-time	2	0	1
Responsible person for the subject: Dr. Eszter Balázsné KAIL			Classification: senior lecturer			
Subject lecturer(s): Péter Tibor ZALETNYIK						
Prerequisites:	NIXSH0EBNE	Computer Networks				
Way of the assessment:	exam					

Course description	
Goal:	This course aims to provide an insight into today's networking technologies. The subject is strongly based on the Computer Networks course. Configuration, testing and troubleshooting of networks built from real devices will help students to master the course material.
Course description:	The course will provide insight into advanced switching (CEF), traffic management (OSPF, EIGRP) and redundancy protocols (STP, RSTP, Etherchannel, HSRP, GLBP), as well as solutions supporting IPv4-IPv6 migration (NAT, CG-NAT) and IPv6 traffic management. The course will cover the theoretical background and typical practices of these protocols and technologies.

Lecture schedule	
Education week	Topic
1.	LE: Repeat: Physical, Data Link Layer, MAC Addressing, Switch LA: Repeat: Switch Configuration
2.	LE: Repeat: Network layer, IPv4, IPv6, ARP LA: Repeat: Router Configuration
3.	LE: Advanced switching skills (VLAN, STP, RSTP, VTP) LA: VLAN and VLAN Routing
4.	LE: Network redundancy: Etherchannel, FHRP, HSRP LA: STP configuration
5.	LE: Repeat: traffic management, static implementation LA: Configuring Etherchannel
6.	LE: OSPF (Single Area) LA: HSRP Configuration
7.	LE: EIGRP LA: Break (Easter Monday)
8.	LE: Traffic Management in IPv6 environment LA: OSPF (Single Area)
9.	LE: Repeat: Transport, Application layer, DHCPv4, DHCPv6, SLAAC LA: EIGRP
10.	EA: Traffic filtering options (ACL) and address translation LA: Static Route IPv6, SLAAC
11.	EA: Break (TDK) LA: ACL (basic), NAT-PAT
12.	EA: Break (1 May) LA: Practice Exercise
13.	EA: Network design using Háltech 1 LA: Midterm exam
14.	EA: Consultation session LA: Replacement midterm exam

Mid-term requirements	
Conditions for obtaining a mid-term grade/signature	**The student's absence from class must not exceed 30%. To measure this, the transcript of each class must be handed in to the instructor at the end of the laboratory session.The other requirement for signature is the completion of a practical final examination in week 13 with a minimum of 50%.**

Assessment schedule	
Education week	Topic
13.	Practical midterm exam
14.	Substitute midterm exam

Method used to calculate the *mid-term grade* (to be filled out only for subjects with mid-term grades)

Type of the replacement	
Type of the replacement of written test/mid-term grade/signature	**If the student has not written the practical final examination in week 13 or has not achieved 50% of the marks, he/she can make up the examination in week 14.** **If the student is unable to obtain a signature here, he/she may attend a signature make-up session in the first two weeks of the examination period.**

Type of the exam (to be filled out only for subjects with exams)

The exam consists of two parts:
At the beginning of the exam, the examiner gives the candidate a pop-up task to assess his/her practical debugging skills. He/she has to find preset faults on a live topology and document how the fault was detected and handled. If you pass the debugging test, i.e. you score 50% of the mark, you can take the oral exam.
In the oral examination, the student draws an thesis from the pre-set list of thesis and after a short period of elaboration, he/she passes it at the examiner's office.

Calculation of the exam mark (to be filled only for subjects with exams)

The examination mark is calculated by weighting the results of the practical exercise, the subtest and the oral examination as follows: 0,4 * LabMT% + 0,1 * Pop-in% + 0,5 * OralResult%

Final grade calculation methods:

Result obtained Examination mark
0%-49% fail (1)
50%-60% pass (2)
61%-73% average (3)
74%-86% good (4)
87%-100% excellent (5)

References	
Obligatory:	**Class presentations and notes**
Recommended:	Tannenbaum A. S.: Computer Networks 3rd Extended Edition, Prentice Hall-Panem, 2013 Wendell Odom: CCNA Routing and Switching 200-125 Official Cert Guide Library, Pearson Education, 2016, ISBN: 1587205815 Edgeworth Brad: CCNP and CCIE Enterprise Core, Official Cert Guide, Cisco Press, 2019, ISBN13: 9781587145230
Other references:	Notes and other resources published in Moodle