

Cyber-physical Systems Institute			Semester 2. of the curriculum 2025-26-2							
Name of the subject:	Code of the subject:	Credits:	Weekly hours:							
				lec	sem	lab				
<b>Advanced network technologies and their security</b>	NKXHH1EMNF	4	full-time	2	0	2				
Responsible person for the subject: Balázsne Dr. Kail Eszter	Classification: Senior lecturer									
Subject lecturer(s): Balázsne Dr. Kail Eszter										
Prerequisites:										
Way of the assessment:	Exam									
<b>Course description</b>										
Goal:	The goal of the course is to enable students to design, configure, and manage small, medium and large-scale enterprise networks, taking modern security considerations into account.									
Course description:	The course material introduces the design concepts of LAN and WAN networks and their scalability options, familiarizing students with advanced routing solutions, redundancy protocols and their vulnerabilities. During the semester, students will learn about VPN technologies), as well as next-generation firewall and IDS/IPS technologies.									

<b>Lecture schedule</b>	
Education week	Topic
1.	Switching and routing basics I.
2.	Switching and routing basics II.
3.	Redundancy protocols
4.	Advanced routing protocols
5.	Introduction to security of computer networks, security threats
6.	AAA
7.	Protection of network devices
8.	Firewall generation, technologies
9.	Next Generation Firewalls
10.	IDS/ IPS solutions
11.	VPN technologies I.
12.	VPN technologies II.
13.	Lab exam
14.	Lab exam

<b>Mid-term requirements</b>	
Conditions for obtaining a mid-term grade/signature	<b>Participation at the lessons is mandatory. Students who missed more than 30% of lessons should take a signature retake exam. A successful test is mandatory to acquire grade.</b>

<b>Assessment schedule</b>	
Education week	Topic
13.	<b>Lab exam</b>

14.	<b>Lab exam retake</b>												
<b>Method used to calculate the <i>mid-term grade</i> (to be filled out only for subjects with mid-term grades)</b>													
<b>Test result needs to exceed 51%.</b>													
<b>Type of the replacement</b>													
Type of the replacement of written test/mid-term grade/signature	<b>In the case if the mid-term test does not reach 50%, the student can replace the test in the form of re-take test in the 14th week. Replacement of the mid-term mark: once in the first 10 working days of the examination period.</b>												
<b>Type of the exam</b> (to be filled out only for subjects with exams)													
The exam consists of a lab exam and an oral exam													
<b>Calculation of the exam mark</b> (to be filled only for subjects with exams)													
The final grade will be calculated as the average of the results of the lab exam and the oral exam, but both must reach at least 51%.													
<b>Final grade calculation methods:</b>													
The final grade will be calculated using the following scale:													
<table border="1" style="width: 100%; text-align: center;"> <tr> <th style="width: 30%;">Achieved result</th><th style="width: 70%;">Grade</th></tr> <tr> <td>87% - 100%</td><td>excellent (5)</td></tr> <tr> <td>75%- 86%</td><td>good (4)</td></tr> <tr> <td>64% -74%</td><td>satisfactory (3)</td></tr> <tr> <td>51% - 63%</td><td>pass (2)</td></tr> <tr> <td>0 - 50 %</td><td>failed (1)</td></tr> </table>		Achieved result	Grade	87% - 100%	excellent (5)	75%- 86%	good (4)	64% -74%	satisfactory (3)	51% - 63%	pass (2)	0 - 50 %	failed (1)
Achieved result	Grade												
87% - 100%	excellent (5)												
75%- 86%	good (4)												
64% -74%	satisfactory (3)												
51% - 63%	pass (2)												
0 - 50 %	failed (1)												
<b>References</b>													
Obligatory:	Lecture notes, Cisco Network Academy course material												
Recommended:	<ul style="list-style-type: none"> <li>– Omar Santos: CCNP and CCIE Security Core; Official Cert Guide, Cisco Press, 2020, ISBN: 0135971977</li> <li>– Edgeworth Brad: CCNP and CCIE Enterprise Core, Official Cert Guide, Cisco Press, 2019, ISBN13: 9781587145230</li> </ul>												
Other references:													