

Cyber-physical Systems Institute			Semester 6. of the curriculum 2025-26-2			
Name of the subject:	Code of the subject:	Credits:	Weekly hours:			
				lec	sem	lab
Security of Computer Networks and Clouds	NIXSH1CBNE	5	full-time	2	0	2
Responsible person for the subject: Balázs né Dr. Kail Eszter			Classification: Senior lecturer			
Subject lecturer(s): Balázs né dr. Kail Eszter, Farkas Attila						
Prerequisites:	NIXHT1CBNE	Network technologies I.				
Way of the assessment:	Exam					
Course description						
Goal:	The aim of the subject is to familiarize students with basic network and cloud security issues, to give students a deeper insight into the different defense mechanisms and techniques.					
Course description:	The curriculum introduces network security basics: the devices, applications that comprise the network infrastructure, access management, authentication, authorization and accounting possibilities, router hardening, switch security issues, network Intrusion Detection Systems (IDS), network Intrusion Prevention Systems (IPS), Virtual Private Networks (VPN). During the lessons students also learn how to configure and maintain network devices with security measures and how to defend against known vulnerabilities. Finally, the students learn about cloud security models and the Openstack private cloud; it's security solutions via Keystone and Neutron components.					

Lecture schedule	
Education week	Topic
1.	Introduction to network security, security threats
2.	Securing network devices, AAA
3.	ACLs and firewall technologies
4.	Zone based firewall
5.	Securing Local Area Networks
6.	Openstack basics, Openstack Keystone
7.	Openstack Neutron, Cloud security models
8.	Holiday
9.	Basics of secure communication
10.	Dedicated firewall, ASA
11.	Intrusion Detection- IDS, IPS
12.	VPN
13.	Lab exam
14.	Lab exam retake
Mid-term requirements	
Conditions for obtaining a mid-term grade/signature	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.

Assessment schedule													
Education week	Topic												
13.	Lab exam												
14.	Lab exam retake												
Method used to calculate the <i>mid-term grade</i> (to be filled out only for subjects with mid-term grades)													
Test result needs to exceed 51%.													
Type of the replacement													
Type of the replacement of written test/mid-term grade/signature	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.												
Type of the exam (to be filled out only for subjects with exams)													
The exam consists of a lab exam and an oral exam													
Calculation of the exam mark (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%.													
Final grade calculation methods:													
The final grade will be calculated using the following scale:													
	<table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th style="text-align: center;">Achieved result</th> <th style="text-align: center;">Grade</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">87% - 100%</td> <td style="text-align: center;">excellent (5)</td> </tr> <tr> <td style="text-align: center;">75%- 86%</td> <td style="text-align: center;">good (4)</td> </tr> <tr> <td style="text-align: center;">64% -74%</td> <td style="text-align: center;">satisfactory (3)</td> </tr> <tr> <td style="text-align: center;">51% - 63%</td> <td style="text-align: center;">pass (2)</td> </tr> <tr> <td style="text-align: center;">0 - 50 %</td> <td style="text-align: center;">failed (1)</td> </tr> </tbody> </table>	Achieved result	Grade	87% - 100%	excellent (5)	75%- 86%	good (4)	64% -74%	satisfactory (3)	51% - 63%	pass (2)	0 - 50 %	failed (1)
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References													
Obligatory:	Lecture notes, Cisco Network Academy course material												
Recommended:	<ul style="list-style-type: none"> – Fundamentals of Network Security Companion Guide (Cisco Networking Academy Program) Cisco Systems, Cisco Networking Academy Program, ISBN: 1587131226 – Fundamentals of Network Security Lab Companion and Workbook (Cisco Networking Academy Program) Cisco Systems, Inc., Cisco Networking Academy Program. ISBN: 1587131234 – Matt Dorn, Preparing for the Certified OpenStack Administrator Exam, Packt Publishing, ISBN: 1787288412 												
Other references:													