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| **Óbuda University**<br>John von Neumann Faculty of Informatics | | | Institute for Cyber-physical Systems | |
| **Name and code:** *Security of Computer Networks and Clouds (NIXSH1CBNE)* **Credits*: 5***<br><br>*Computer Science and Engineering BSc programme* *2019/20 year II. semester* | | | | |
| | | | | |
| Subject lecturers: Dr. Bánáti Anna, Dr. Kail Eszter, Farkas Attila | | | | |
| Prerequisites (with code): | Network Technologies I. (NIXHT1CBNE) | | | |
| Weekly hours: 4 | Lecture: 2 | Seminar.: 0 | Lab. hours: 2 | Consultation: 0 |
| Way of assessment: | mid-term tests, mid-term presentation, oral exam, lab 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 |
| 3. | Authentication, Authorization, Accounting |
| 4. | ACLs and firewall technologies |
| 5. | Zone based firewall |
| 6. | Intrusion Detection- IDS, IPS |
| 7. | Securing Local Area Networks |
| 8. | Basics of secure communication |
| 9. | VPNs - IPSec |
| 10. | Dedicated firewall, ASA |
| 11. | Network Management |
| 12. | Openstack basics |
| 13. | Openstack Keystone |
| 14. | Openstack Neutron, Cloud security models |

**Midterm requirements**

| *Education week* | *Topic* |
|---|---|
| *7* | written test |
| 13 | written test |
| 14 | retake exam |

**Final grade calculation methods**

| Achieved result | Grade |
|---|---|
| 89%-100% | excellent (5) |
| 76%-88<% | good (4) |
| 63%-75<% | average (3) |
| 51%-62<% | satisfactory (2) |
| 0%-50<% | failed (1) |

**Type of exam**

Oral and lab exam.

**Type of replacement**

Once on the 14th week.

**References**

Mandatory: Lecture notes, Cisco Network Academy course material

Recommended:
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