

**SUBJECT DETAILS AND SYLLABUS**  
**2020/2021. I. SEMESTER**

<b>Subject name</b>	<b>Computer Networks 1.</b>
<b>Subject code</b>	<b>IVB370ANVM</b>
<b>Classes per week: L/P/Lab</b>	<b>2/0/2</b>
<b>Number of Credits</b>	<b>4</b>
<b>Division/ type</b>	<b>Electrical Engineering (BSc) / mandatory</b>
<b>Program</b>	<b>full time</b>
<b>Requirement type</b>	<b>grade</b>
<b>Semester</b>	<b>5.</b>
<b>Preliminary requirements</b>	<b>Communication Systems</b>
<b>Organization name</b>	<b>Department of Electrical Networks</b>
<b>Responsible Lecturer(s)</b>	<b>Peter Megyeri</b>

**GOAL OF INSTRUCTION**

The course introduces to students to the structure, characteristics and selection aspects of computer networks and network active devices, which occur in engineering practice. It introduces the computer networking standards, the basics of router configuration and network planning. Outlines practical applications of computer networks and the connections to other areas of expertise. By completing the course, students will acquire proficiency in the operation of IP-based communication, the design of IP networks, and the operation and configuration of routing and the IP protocols. They will also learn the basics of QoS and how it works.

**SUBJECT CONTENT**

*Brief Syllabus:*

*Schedule:*

Lecture:

1. IP addressing – IPv4.
2. IP addressing – IPv6.
3. Network topologies (LAN és WAN).
4. Network interface cards: NIC (architecture, features, typical interfaces, speeds).
5. Network segmentation. (L2, L3). Subnetting, VLAN.
6. Interconnection of networks. Supernetting. ACL. Hardware and software structure and characteristics of routers.

7. Routing. General characteristics of routing protocols (static, dynamic; external, internal). Redundancy protocols.
8. General characteristics of distance-based dynamic routing protocols, RIP (versions: v2, nG).
9. General characteristics of EIGRP.
10. General characteristics of link-state based routing protocols, OSPF (versions).
11. External routing protocols, general characteristics of autonomous systems (AS, basics of BGP).
12. Basics of Juniper devices – interface configuration, static routing.
13. Juniper – dynamic routing protocols in JunOS (OSPF, BGP), routing rules, firewall filters.
14. QoS (Cisco, Juniper).

#### Practice/Labs:

1. IPv4-es addressing.
2. IPv6-os addressing.
3. Typical hardware and software architecture of network active devices. (NAT).
4. Configuration and features of operation of network interfaces.
5. Segmentation with switches and routers.
6. Turning on routers, and interfaces set up.
7. CISCO: Monitoring of routing table, static paths configuration. Creation of HSRP configuration.
8. CISCO: Basic configuration of RIP.
9. CISCO: Basic configuration of EIGRP.
10. CISCO: Basic configuration of OSPF.
11. CISCO: Basic configuration of BGP.
12. JunOS: CLI, configuration of user modes, and interfaces, control of operation, creation of static paths.
13. JunOS: studying routing and forwarding table, establishing of OSPF / BGP connection, configure a routing rule.
14. Interpreting QoS configuration of a Cisco and a Juniper devices, testing their functionality, ACL.

## EXAMINATION AND EVALUATION SYSTEM

### *Attendance:*

Regarding participation in exercises and lectures, appropriate points of TVSz. are authoritative. According to this, the student cannot obtain the credit point of the subject, if the absence of the relevant classes exceeds 30% of the total number of practices or lectures.

### *Criterion of Signiture / Semester rating:*

Forms of controlling under the semester: written exams, and homework. During the semester, students write two exams, one of which are written on practice and one is written on the lecture. The topic of the exams is the material of the practices and lectures given till a given week. The exact time of the exams will be announced in the given classes of the subject. The homework will be released on practice, at the latest until the 10th week. The condition for obtaining the signature is to write the exams and to submit an acceptable homework during the semester.

### *Exam:*

Written exam, minimum of 51 % is required to pass.

### *Grading:*

The written and the practical exams are evaluated with grades. The weighting used to create the semester rating:

- Homework: 33 %.
- Average of written exams: 33 %
- Written exam in the exam period: 33 %.

### *Grading scale:*

Numeric Grade	5	4	3	2	1
Evaluation interval:	90–100%	76–89%	63–75%	51–62%	0–50%

### *Consultation options:*

At the time agreed in advance with the responsible instructor.

## LITERATURE

- [1.] Tannenbaum, Andrew S.: Computer Networks, Prentice Hall, 2011
- [2.] Stallings, William: Data and Computer Communication, Macmillan Publishing Company.
- [3.] Jeff Doyle, Jennifer DeHaven Carroll: Routing TCP/IP, Volume II, ISBN: 1578700892 Publisher: Cisco Press
- [4.] Kennedy Clark, Kevin Hamilton: Cisco LAN Switching, ISBN: 1578700949 Publisher: Cisco Press
- [5.] Rami Rosen: Linux Kernel Networking, Implementation and Theory, Kiadó: Apress, 2014
- [6.] Presentations on lectures and practices, and written lecture notes

SCHEDULE

		STUDY PERIOD, STUDY WEEKS															EXAM PERIODK				
2020/2021. I. SEMESTER		1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	1.	2.	3.	4.	5.
<b>Lecture number</b>																					
<b>Partice/Labs number</b>																					
<b>Midterm test</b>								X			X										
<b>Homework</b>	<b>publishing</b>								X												
	<b>submitting</b>														X						
<b>Signiture/ Semester rating</b>																		X			
<b>Exam</b>																					

09/10/2020.

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Peter Megyeri responsible lecturer