



## Tárgytematika

Félév: 2023/24/2

Tárgynév: Computer Networks 2.

Tárgykód: IVB371ANVM

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<b>Felelős szervezet neve:</b>	Informatika és Villamos Intézet
<b>Felelős szervezet kódja:</b>	MIK-IV
<b>Tárgyfelelős neve:</b>	Megyeri Péter
<b>Tárgy követelménye:</b>	Vizsga
<b>Tárgy heti óraszám:</b>	1/0/2/0
<b>Tárgy féléves óraszám:</b>	5/0/10/0

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### Oktatás célja:

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 network standards, the basics of active device configuration and network planning. By completing the course, students will acquire proficiency in designing the network solutions used in different companies, and configuration possibilities of network active devices. Outlines practical applications of computer networks and the links to other areas of expertise.

### Tantárgy tartalma:

#### Lecture:

1. Segmentation of Networks. Hardware, software architecture, and features of the Switches.
2. Switching theory. Operating modes of switches.
3. Spanning Tree Protocol. Avoiding loops in data transmission.
4. Concept and design aspects of VLANs. Static and dynamic VLANs.
5. The concept and standardized solutions of tagging.
6. Trunking of VLANs. Introduction and features of trunking protocols.
7. Connecting of VLANs. The concept of native VLAN, its application in network data transmission.
8. Interconnection of networks. Hardware and software structure and features of the Routers.
9. The features of Router's LAN Interface. Concept, configuration and features of Subinterfaces.
10. Aspects of traffic filtering and network access development. Firewall types.
11. Traffic filtering with a Router. Standard and Extended Access Control Lists (ACLs).
12. Network Management. The SNMP protocol.
13. Telecommunication and WAN technologies.
14. Telecommunication networks and systems. WAN networks.

#### Practice/Labs:

1. Default settings and typical Configuration File structure of Switches.
2. VLANs, and ports configuration of Switches.
3. Principles of VLAN interconnection.
4. Configuration of Subinterfaces. Trunking configuration on the router.
5. Operation checking and troubleshooting of switches.
6. Principles and aspects of ACL design.



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### Tantárgy tartalma:

7. Basics of Network Security. Configuration and positioning of ACLs.
8. Analysis of practical running configuration files of routers and switches.
9. Aspects of development of Network management. Configuration of SNMP protocol.
10. Features and configuration of xDSL, Frame Relay and ISDN interface.
11. Features and configuration of T1, E1 interfaces.
12. The structure and characteristics of COs and PBXs.
13. The characteristics of different traffic types. The aspects of shaping of network configuration and bandwidth.
14. Demonstration of the configuration of other types of traffic, through practical examples.

### Számonkérési és értékelési rendszere:

#### *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 exam, homework, and project. During the semester, students write an exam, which is written on practice. The topic of the exam is the material of the practices and lectures given till a given week. The exact time of the exam will be announced in the given class of the subject. The topic of the project must be relevant to the subject, and must be agreed in advance with the lecturer 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 exam and to submit an acceptable (minimum grade 2) homework, and project during the semester. Besides these, the students must be present on more than 70% of contact classes and/or consultations. Having more than 30% absence results in signature refusal.

#### *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:



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### Számonkérési és értékelési rendszere:

- Homework: 20 %,
- Written exams: 40 %,

- Project: 40 %.

- Written exam in the exam period: 50 %.

### Grading scale:

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

### Failing the requirements:

The Code of Studies and Examinations of the University of Pécs is applicable in general.

- Students have one midterm test retake opportunity before the exam period.
  - Schedule: 15th week's lecture
  - Format: same as the test
- Students without signature have one opportunity to earn a passing midterm grade and signature in the exam period.
  - Schedule: 1st week of the exam period, lecture time
  - Format: written test and a new homework with oral presentation

### Consultation options:

At the time agreed in advance with the responsible instructor.

### Kötelező irodalom:

1. Tannenbaum, Andrew S.: Computer Networks, Prentice Hall, 2011
2. Stallings, William: Data and Computer Communication, Macmillan Publishing Company.
3. Jeff Doyle, Jennifer DeHaven Caroll: Routing TCP/IP, Volume II, ISBN: 1578700892 Publisher: Cisco Press



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**Kötelező irodalom:**

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

**Ajánlott irodalom:**