

SYLLABUS

Discipline name	Computer Networks
Profile	Electronics and Telecommunications Engineering
Specialization	Telecommunications Technologies and Systems
Code	51324309
Course leader	Associate Professor Daniel Zinca, Ph.D – Daniel.Zinca@com.utcluj.ro
Collaborators	
Department	Communications
Faculty	Electronics, Telecommunications and Information Technology

Sem.	Type of discipline	Course			Applications			Ind. study	TOTAL	Credits	Form of assessment		
		[hours/week]			[hours/semester]								
		S	L	P	S	L	P						
6	Speciality	2	-	2	-	28	-	28	-	94	150	5	V

Acquired competences :

Reference models for computer networks; Computer Networks Classification; Networking devices used in computer networks; Serial communications on the physical and data-link layers; Data-link layer protocols; Medium Access Control techniques; The Ethernet/IEEE 802.3 family of standards; The IEEE 802.11 WLAN standard; Techniques used for improving LAN performance: layer 2 switching, VLAN (Virtual LAN), CoS(Class of Service), STP (Spanning Tree Protocol); Architectures used in computer networks programming; Basic knowledge about computer networks security;

Acquired skills (what the student is able to do):

After completion of this course the students will be able to:
 Understand the basic architectures in computer networks
 Identify the networking devices used in computer networks and configure some of them
 Understand and use the main networking standards on the physical and data-link layers.
 Design a structured cabling system
 Design a LAN using IEEE 802.3 devices.
 Design a WLAN according the IEEE 802.11 standard
 Use Layer 2 switches and use their additional features
 Understand basic network security principles and applications.

Acquired abilities (what type of equipment/ instruments/ software the student is able to handle):

After completion of this course the students will be able to:

- Configure Layer 2 switches
- Configure network security devices
- Use network cable testers
- Configure WLAN devices (Access Points, WLAN bridges, etc.)
- Know and configure networking products from Cisco, Linksys, Allied Telesys, Corega, 3Com

Prerequisites (if necessary):

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A. Course/Lecture (course/lecture titles)

1	The OSI Reference Model. Introduction to computer networking.
2	Networking devices. Computer network characteristics.
3	Serial communications. WAN networks. The Physical and Data Link Layers.
4	PPP (Point to Point Protocol)
5	The USB (Universal Serial Bus) Interface
6	Structured cabling of commercial buildings. Standards, design.
7	LANs (Local Area Networks). MAC and LLC sublayers. The IEEE 802.2 LLC standard
8	The IEEE 802.3/ Ethernet Standard.
9	The IEEE 802.3u Fast Ethernet ; IEEE 802.3z, IEEE 802.3ab Gigabit Ethernet Standards
10	The IEEE 802.3ae/ 10 Gbps Ethernet Standard
11	The IEEE 802.11 WLAN Standard. WLAN Security
12	Techniques used for improving LAN performance
13	Computer Networks programming
14	Computer Networks security

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B. Applications – Laboratory (list of laboratories), Seminar (contents), Project (project contents)	
1	The OSI Reference Model
2	Networking devices. Hubs, switches, computer configuration in a network.
3	The V.24 serial interface programming and applications.
4	PPP implementation in MS Windows
5	USB Interface
6	Structured cabling project
7	Medium Access Control Techniques.
8	The Ethernet/IEEE 802.3 Network Interface Card
9	Fast Ethernet/Gigabit Ethernet Devices
10	Configuration of IEEE 802.11 WLAN devices
11	Configuration of Layer 2 switches.
12	Fiber optic structured cabling
13	VLAN implementation in Layer 2 switches
14	Computer Networks security

C. Individual study (reference study contents, synthesis materials, projects, applications etc.)						
2 synthesis reports: Interconnection equipment, LAN design						
Individual study structure	Course study	Problem solving, laboratory, project	Applications preparation	Examination time	Additional reference study	Total no. of individual study hours
Hours	28	36	18	3	9	94

References (Textbooks, courses, laboratory manual, exercise book)
1. Zinca, D. – Rețele de calculatoare, Editura Risoprint, Cluj-Napoca, 2006, ISBN 978-973-751-223-9.
2. Dobrota, V., Zinca, D., - Retele de comunicatii multimedia, ODESC, Cluj-Napoca, 1999
3. Dobrota, V. – Rețele digitale în comunicații, Vol. 3 OSI și TCP/IP, Editura Mediamira, Cluj-Napoca, 2003
On – line references
1. Zinca, D. – Computer Networks, Laboratory works, http://172.27.208.164/LabRetele (limited acces, password-based)
2. Zinca, D. – Computer Networks, Lectures, http://172.27.208.164/ (limited access, password-based)

Final evaluation	
Evaluation method	Two written verifications (1.5 hours each).
Mark components	Mini-project (MP); Test 1(T1), Test 2 (T2);
Mark computation	$N=0.2MP+0.4T1+0.4T2$; To obtain the credits: $N \geq 5$; $T1 \geq 5$; $MP \geq 5$; $T2 \geq 5$

Course leader,

Associate Professor Daniel ZINCA, Ph.D.
