UNIVERSITATEA TEHNICĂ DIN CLUJ-NAPOCA
Facultatea de Electronică, Telecomunicații și Tehnologia Informației
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SYLLABUS

1. Data about the program of study

1.1	Institution	The Technical University of Cluj-Napoca
1.2	Faculty	Electronics, Telecommunications and Information Technology
1.3	Department	Communications
1.4	Field of study	Electronics and Telecommunications Engineering
1.5	Cycle of study	Bachelor of Science
1.6	Program of study/Qualification	Telecommunications Technologies and Systems/ Engineer
1.7	Form of education	Full time
1.8	Subject code	TST-E43.00

2. Data about the subject

2.1	Subject name	Computer Networks			
2.2	Subject area	Electronics and Telecommunications Engineering			
2.3	Course responsible/lecturer	Associate Professor Daniel ZINCA, PhD			
2.4	Teachers in charge of applications	Assistant Iustin IVANCIU			
2.5	Year of study II	2.6 Semester 2	2.7 Assessment Verification	2.8 Subject category DS/DOB	

3. Estimated total time

Year/ Sem.	Subject name	No. of weeks	Course [hours/ week]	Applications [hours/ week] S	Applications [hours/ week] L	Applications [hours/ week] P	Course [hours/ semester]	Applications [hours/ semester] S	Applications [hours/ semester] L	Applications [hours/ semester] P	Indiv. study	TOTAL	Credits
III/2	Computer Networks	14	2		2		28		28		74	130	5

3.1	Number of hours per week	4	3.2	of which, course	2	3.3	applications	2
3.4	Total hours in the curriculum	56	3.5	of which, course	28	3.6	applications	28

Individual study	Hours
Manual, lecture material and notes, bibliography	40
Supplementary study in the library, online and in the field	-
Preparation for seminars/laboratory works, homework, reports, portfolios, essays	28
Tutoring	3
Exams and tests	3
Other activities	

3.7	Total hours of individual study	74
3.8	Total hours per semester	130
3.9	Number of credit points	5

4. Pre-requisites (where appropriate)

4.1	Curriculum	NA
4.2	Competence	Basic concepts for computer networks, OSI Reference Model; operating principles an configuration for networking devices: hubs, switches, Access Points; design of a structured cabling system; LAN standards; IEEE 802.3/Ethernet family of standards; IEEE 802.11 WLAN standards; basic concepts for network security.

5. Requirements (where appropriate)

5.1	For the course	Cluj-Napoca
5.2	For the applications	Cluj-Napoca

6. Specific competences

Professional competences	C4. To design, implement and operate data, voice, video and multimedia services, based on the understanding and application of fundamental concepts from the field of communications and information transmission. C5. To select, install, configure and exploit fixed and mobile telecommunications equipment. To equip a site with common telecommunications networks. C6. To solve wide-band telecommunications networks' specific problems: propagation in various transmission media, high frequency circuits and equipment (microwaves and optical).
Cross competences	N.A.

7. Discipline objectives (as results from the key competences gained)

7.1	General objectives	Developing the competences regarding the use and design of computer networks.
7.2	Specific objectives	1. Understanding basic concepts specific to computer networks. 2. Developing skills and abilities necessary for the use of computer networks. 3. Developing skills and abilities for the design of computer networks.

8. Contents

8.1. Lecture (syllabus)		Teaching methods	Notes
1	Course description. The OSI Reference Model. Introduction to Computer Networks	Presentation, heuristic conversation, exemplification, problem presentation, teaching exercise, case study, formative evaluation	Use of .ppt presentation, projector, blackboard
2	Networking devices. Computer networks characteristics.		
3	WANs. Serial communications. The physical and data link layers.		
4	The Point-to-Point Protocol		
5	Universal Serial Bus.		
6	Structured cabling systems. Standards. Design.		
7	Local Area Networks. The MAC and LLC sublayers. The IEEE 802.2 LLC standard.		
8	The IEEE 802.3/Ethernet family of standards.		
9	The IEEE 802.3u/Fast Ethernet, IEEE 802.3z/802.3ab Gigabit Ethernet standards.		

			Teaching methods	Notes
10	The IEEE 802.3ae/10Gigabit Ethernet standard			
11	The IEEE 802.11 WLAN Standards. Physical Layer options .The MAC sublayer.			
12	IEEE and Wi-Fi alliance standards for WLAN security.			
13	Performance improvement in LANs.			
14	Introduction to network security. Preparation for the second verification.			

8.2. Applications (lab)		Teaching methods	Notes
1	Introduction. Labour protection.The OSI Reference Model	Didactic and experimental proof, didactic exercise, team work	Use of laboratory instrumentation, experimental boards, computers, magnetic board
2	Monitoring of networking devices: hubs, switches.		
3	The ITU V.24 serial interface. Applications.		
4	The PPP implementation.		
5	The USB interface		
6	Structured cabling systems project		
7	Wireshark packet analyzer. Applications		
8	The IEEE 802.3 Network Interface Card.		
9	Fast Ethernet/Gigabit Ethernet devices		
10	Switch configuration. VLAN configuration in switches		
11	WLAN AP and NIC configuration		
12	Configuration of WLAN Security		
13	Security configuration in routers using SDM/CCP.		
14	Lab recovery and finalization of laboratory activity		

Bibliography

1. D. Zinca, *Retele de calculatoare*. Editura Risoprint, Cluj-Napoca 2006
2. C.M. Vancea, D. Zinca, *Retele de Calculatoare, Indrumator de laborator*. Editura UTPress, 2011
3. V. Dobrota, *Retele digitale in telecomunicatii. Volumul III: OSI si TCP/IP. Editia a II-a*, Editura Mediamira, Cluj-Napoca 2003
4. A.S. Tanenbaum, D.J. Wetherall, *Computer Networks. Fifth Edition*, Prentice Hall 2010

On-line references
1. D. Zinca, Computer Networks. Technical University of Cluj-Napoca, 2014
   http://172.27.208.164/ComputerNetworks.html

9. **Bridging course contents with the expectations of the representatives of the community, professional associations and employers in the field**

Competences acquired will be used in the following COR occupations (Electronics Engineer; Telecommunications Engineer; Electronics Design Engineer; System and Computer Design Engineer; Communications Design Engineer) or in the new occupations proposed to be included in COR (Sale Support Engineer; Multimedia Applications Developer; Network Engineer; Communications Systems Test Engineer; Project Manager; Traffic Engineer; Communications Systems Consultant).

10. Evaluations

Activity type	10.1	Assessment criteria	10.2	Assessment methods	10.3	Weight in the final grade
Course		The level of acquired theoretical knowledge and practical skills		- 2 evaluation tests (require answers to theoretical questions)		- T, max 12 pts. 66%
Applications		The level of acquired abilities		- 2 evaluation tests (requires answers to practical questions)		- L, max. 6 pts. 34%

10.4 Minimum standard of performance
$0.5T + 0.5L \geq 4.5$

Date of filling in   Course responsible   Teachers in charge of applications

01.10.2014   Associate Professor   Assistant

Daniel ZINCA, PhD   Iustin IVANCIU

Date of approval   Head of Communications

in the department   Department

01.10.2014   Professor Virgil DOBROTA, PhD