SYLLABUS

1. Information about the program

1.1 Higher education institution	UNIVERSITY POLITEHNICA OF TIMISOARA
1.2 Faculty[1]/ Department [2]	ELECTRONICS, TELECOMUNICATON AND INFORMATION TECHNOLOGIES/COM
1.3 Field of study (name/code[3])	ELECTRONIC ENGINEERING, TELECOMUNICATION AND INFORMATION TECHNOLOGIES
1.4 Study cycle	License
1.5 Study program (name/code/qualification)	TST-ENG/20/20/10/100/10/TST-ENG

2. Information about the discipline

2.1 Name of discipline/ formative category[4]	Communications protocols/DD						
2.2 Coordinator (holder) of course activities	Şl. dr. ing. Cristina STOLOJESCU-CRIŞAN						
2.3 Coordinator (holder) of applied activities[5]	Şl. dr. ing. Cristina STOLOJESCU-CRIŞAN						
2.4 Year of study[6]	3	**2.5** Semester	6	**2.6** Type of evaluation	E	**2.7** Regime of discipline[7]	DO

3. Total estimated time – hours / semester: direct teaching activities (fully assisted or partly assisted) and individual training activities (unassisted) [8]

3.1 Number of fully assisted hours / week	4 of which:	**3.2** course	2	**3.3** seminar / laboratory / project	0/2/0
3.1* Total number of fully assisted hours / semester	56 of which:	**3.2*** course	28	**3.3*** seminar / laboratory / project	0/28/0
3.4 Number of hours partially assisted / week	of which:	**3.5** training		**3.6** hours for diploma project elaboration	
3.4* Total number of hours partially assisted / semester	of which:	**3.5*** training		**3.6*** hours for diploma project elaboration	
3.7 Number of hours of unassisted activities / week	1.36 of which:	additional documentary hours in the library, on the specialized electronic platforms and on the field			0.5
		hours of individual study after manual, course support, bibliography and notes			0.5
		training seminars / laboratories, homework and papers, portfolios and essays			0.36
3.7* Number of hours of unassisted activities / semester	19 of which:	additional documentary hours in the library, on the specialized electronic platforms and on the field			7
		hours of individual study after manual, course support, bibliography and notes			7
		training seminars / laboratories, homework and papers, portfolios and essays			5
3.8 Total hours / week [9]	5.36				
3.8* Total hours /semester	75				
3.9 Number of credits	3				

4. Prerequisites (where applicable)

4.1 Curriculum	• Computer Networks Architecture
4.2 Competencies	•

5. Conditions (where applicable)

5.1 of the course	• Classroom with projector, blackboard
5.2 to conduct practical activities	• Laboratory with computers connected to the Internet, Windows, LINUX/UNIX test servers with various services (DNS, HTTP, SMTP)

6. Specific competencies acquired through this discipline

Specific competencies	• Use of fundamental elements related to communication networks, IP addressing, routing protocols, and security.
Professional competencies ascribed to the specific competencies	• Application of knowledge, concepts and basic methods related to computer system architecture, microprocessors, microcontrollers, programming languages and techniques. • Selection, installation, configuration and operation of fixed and mobile equipment and equipping the site with common telecommunication networks.
Transversal competencies ascribed to the specific competencies	• Methodical analysis of field-related problems aimed at identifying acknowledged solutions, thus ensuring the accomplishment of professional tasks. • Definition of activity stages and their distribution to subordinates in terms of responsibilities, providing effective exchange of information and interpersonal communication. • Adaptation to new technologies, professional and personal development through continuous training, using printed documentation sources, specialized software and electronic resources in Romanian and at least one foreign language

7. Objectives of the discipline (based on the grid of specific competencies acquired - pct.6)

7.1 The general objective of the discipline	• The development of professional skills in the field of communication protocols used in the Internet network.
7.2 Specific objectives	• Assimilation of technological knowledge regarding the TCP/IP protocol stack

8. Content [10]

8.1 Course	Number of hours	Teaching methods [11]
Introduction to networking. Communication networks and trends	2	Slides, discussion
Ethernet Networks, Spanning Tree Protocol, and VLANs	2	
Internet Protocol. IPv4. ARP, DHCP, ICMP	2	
Internet Protocol version 6 (IPv6)	2	
Transport Layer Services – TCP and UDP	2	
TCP/IP application protocols	2	
Network routing. Routing algorithms types	2	
Routing Information Protocol (RIP)	2	
Open Shortest Path First (OSPF)	2	

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[10] It details all the didactic activities foreseen in the curriculum (lectures and seminar themes, the list of laboratory works, the content of the stages of project preparation, the theme of each practice stage). The titles of the laboratory work carried out on the stands shall be accompanied by the notation "(*)".

[11] Presentation of the teaching methods will include the use of new technologies (e-mail, personalized web page, electronic resources etc.).

Exterior gateway protocols. BGP	2	
Multi Protocol Label Switching (MPLS)	2	
Network Security. Types of attacks	2	
Cryptography	4	

Bibliography [12]   [1] Corina Botoca, Cristina Stolojescu-Crisan, "Selected topics in communications networks", Ed. Politehnica, ISBN/ISSN 978-606-554-971-5, 2015
[2] S. Tanenbaum Andrew, J. Wetherall David, Computer Networks, 5th edition, ISBN-10 : 9332518742, 2013
[3] Stallings W. Data and Computer Communications, Pearson; 9th edition, 2010
IP Routing: Protocol-Independent Configuration Guide, Cisco IOS XE Release 3S.

8.2 Applied activities [13]	Number of hours	Teaching methods
The OSI and TCP/IP Models. Computer Network Administration. Commands used in Computer Network Administration	2	Exercises. Homework. Project
IP Addressing and the split of a network into subnetworks	4	
The IP addressing planification for services providers. Router interface configuration	4	
Introduction into Cisco Packet tracer	2	
IP routing. Static routes. Pre-defined routes. RIP protocol	2	
Dijkstra's algorithm. OSPF protocol.	2	
BGP protocol	2	
Services. Framework of services. Virtual Private LAN Services (VPLS)	4	
Cryptography. Algorithms	6	

Bibliography [14]   [1] Corina Botoca, Cristina Stolojescu-Crisan, "Selected topics in communications networks", Ed. Politehnica, ISBN/ISSN 978-606-554-971-5, 2015
[2] S. Tanenbaum Andrew, J. Wetherall David, Computer Networks, 5th edition, ISBN-10 : 9332518742, 2013
[3] Stallings W. Data and Computer Communications, Pearson; 9th edition, 2010
IP Routing: Protocol-Independent Configuration Guide, Cisco IOS XE Release 3S.

9. Corroboration of the content of the discipline with the expectations of the main representatives of the epistemic community, professional associations and employers in the field afferent to the program

- Students will acquire appropriate skills for the needs of current qualifications, a scientific and technical training corresponding to the bachelor's level, which will allow them to quickly get a job in the engineering domain after graduation, but also the possibility of continuing their studies through Master and PhD programs

10. Evaluation

Type of activity	**10.1** Evaluation criteria [15]	**10.2** Evaluation methods	**10.3** Share of the final grade
10.4 Course		Exam	50%
10.5 Applied activities	**S:**		
	L: Project completion	Project	50%
	P[16]**:**		
	Pr:		
10.6 Minimum performance standard (minimum amount of knowledge necessary to pass the discipline and the way in which this knowledge is verified [17])			
- 5 for course exam and 5 for project work			

Date of completion	**Course coordinator (signature)**	**Coordinator of applied activities (signature)**

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[12] At least one title must belong to the discipline team and at least one title should refer to a reference work for discipline, national and international circulation, existing in the UPT library.
[13] Types of application activities are those specified in footnote 5. If the discipline contains several types of applicative activities then they are sequentially in the lines of the table below. The type of activity will be in a distinct line as: "Seminar:", "Laboratory:", "Project:" and / or "Practice/training".
[14] At least one title must belong to the discipline team.
[15] Syllabus must contain the procedure for assessing the discipline, specifying the criteria, methods and forms of assessment, as well as specifying the weightings assigned to them in the final grade. The evaluation criteria shall be formulated separately for each activity foreseen in the curriculum (course, seminar, laboratory, project). They will also refer to the forms of verification (homework, papers, etc.)
[16] In the case where the project is not a distinct discipline, this section also specifies how the outcome of the project evaluation makes the admission of the student conditional on the final assessment within the discipline.
[17] It will not explain how the promotion mark is awarded.

18.06.2023

| **Head of Department** | **Date of approval in the Faculty Council** [18] | **Dean** |
| **(signature)** | 14.09.2023 | **(signature)** |

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[18] The endorsement is preceded by the discussion of the board's view of the study program on the discipline record.