



**UNIVERSITY OF PRIZREN**  
**FACULTY OF COMPUTER SCIENCE**

PROGRAM: TIT

Curriculum - -- SYLLABUS								
Level of studies		Bachelor		Program	TIT	Academic year	2017/18	
SUBJECT		TCP/IP Technology						
Year	2	Status Of the subject	Obligatory	Code		ECTS credits	6	
Semester	2							
Teaching weeks		15		Hours teaching	60	Lectures	Exercises	
						30	30	
Teaching Methodology		Presentation of the subject in PowerPoint Numerical and laboratory exercises in conformity with lectures						
Consultation		Once a week						
The teacher		Prof.Ass.Dr. Malush Mjaku		E-mail:	malush.mjaku@uni-prizren.com			
				Tel.:				
Assistant		Ass. PhD.c. Betim Maloku		E-mail:	betim.maloku@uni-prizren.com			
				Tel.:				

Study goal and table of content	Benefits of student
<p>The purpose of this course is to give students general knowledge about the main elements of networks, standards, products and problems that have the role in building and operating a network. Moreover, it will give an overview of the various computer networks and network technologies. It will give the explanation about the TCP/IP protocols and the comparison with the OSI reference model. A detailed explication of IP addressing, IP subnet, and IP routing will be realized. The theoretical part will be combined with numerical and practical examples of subnetation of computer networks and configuration of network devices (Switches and Routers).</p>	<p>After this course, the student is expected to gain sufficient knowledge about: key network elements, standards, products, and problems affecting the construction and operation of a network; WAN and backbone networks; various computer networks and network technologies. The student should gain sufficient knowledge of TCP/IP protocols and should be able to make the difference between the TCP/IP protocol and the OSI reference model. The student should have good knowledge about the subnetation of computer networks, as well as the basics of addressing, commutation and routing. Further, it is expected that after completing this course the student will be able to gain basic knowledge of the configuration of the network devices (Switch, Router).</p>

Methodology for the implementation of educational topics:		
Lectures, interactive approaches, consultations, seminars, numerical exercises, laboratory exercises.		
Conditions for realization of educational topics:		
The use of adequate literature and of IT tools. •		
Ways of assessing the student (in %) :	Evaluation in%	Final grade
A seminary work	Up to 10 points and these points are evaluated outside the	

	total score of the tests and are valid only for students who attend the lectures.	<div>0 – 50% nota5</div> <div>51- 606</div> <div>61- 707</div> <div>71 - 808</div> <div>81 - 909</div> <div>91-10010</div>		
Tests	Two tests, each with 45% of the points. Students can pass the exam if they reach 51% of points out of two tests. Each of the students who does not reach the sum of 51% of points by two tests, then the final exam is required to pass this course.			
Final exam	The final exam contains 100 point. Students can pass the exam if they reach at least 51 points.			
Total	100.00 %			
Obligations of student:				
Lectures		Exercises		
The student during the lectures should: make use of all learning opportunities, use the compulsory and broader literature, be active and respect the rules with high level of ethics.		The student should be active in exercises and reflect the readiness and knowledge of initiatives, ideas and demonstrations of the knowledge acquired in the lectures.		
Activities	Hour	Days/Weeks	Total	
Lectures	2	15 weeks	30 hours	
Laboratory exercises	2	15 weeks	30 hours	
Contacts with teachers / consultations	0.5	15 weeks	3 hours	
Practical work				
Projects, presentations, etc.	1	15 weeks	15 hours	
Own study time	4	15 weeks	60 hours	
Preparation for final exam	5	2 weeks	10 hours	
Time spent in the assessment (tests, final exam, etc.)	1	2 days	2 hours	
Notice: 1 ECTS credits= 25 hour commitment, e.g. if the subject has 6 ECTS credits student must have 150 hours during the semester commitment.		Total load:	150 hours	
Week	Lectures	Hour	Exercises	
	Topic		Topic	
1	CHAPTER I – Communication Networks: Introduction; Network card; Computer configuration for network connection; Types of network configuration.	2	Introduction; Network Elements.	2
2	CHAPTER I - Communication Networks: Local Area Network (LAN); LAN network topologies (bus, star, ring, tree, mesh); Devices used in the LAN network topology; Modems;	2	Presentation of the Cisco Packet tracer software tool for simulation of computer networks; Lab exercises through Cisco Packet Tracer	2

	DSL; ADSL; VDSL; Wireless Access Points (WAP); firewall; Dynamic Host Configuration Protocol (DHCP) server; Standardized model layers - OSI.		software: - Creation of network topology for configuration; -Preparation and connecting computers in the network (configuration of IP addresses);	
3	<b>CHAPTER II - Optical Networks:</b> Introduction; SONET synchronous optical network; Advantages of SONET; Transmission Hierarchy in SONET; SONET Framework Structure; Synchronous digital SDH hierarchy; Advantages of SDH; SDH Framework Structure; SONET / SDH.	2	<b>Lab exercises through Cisco Packet Tracer software:</b> Basic Configurations of Switches and Routers on network topology (configuration of passwords).	2
4	<b>CHAPTER III - Central TCP / IP protocols:</b> Introduction; Architecture, history, standards and trends; TCP/IP protocol; Internet network; TCP/IP protocol layers; TCP/IP applications; Client / server model.	2	<b>Lab exercises through Cisco Packet Tracer software:</b> Console and telnet configuration (Configuration of passwords and practical testing of operation after configuration).	2
5	<b>CHAPTER IV - IP Addressing:</b> Introduction; IP addresses; IP Address Classes; Reserved IP addresses; Special use of IP addresses; IP subnets; Subnet masks; Types of subnetting (class-full and class-less).	2	<b>Numerical exercises:</b> Subnetting IP addresses and subnet masks.	2
6	<b>CHAPTER IV - IP Addressing:</b> Subnetting of class C addresses; Practical examples of subnetting: Addresses of class C Subnetting of class B addresses; Practical examples of subnetting: Class B addresses; Subnetting Class A addresses; Practical examples of subnetting: Class A addresses	2	<b>Numerical exercises:</b> IP address classes, subnetting and wildcard mask.	2
7	<b>The first test</b>	2	<b>The first laboratory test</b>	2
8	<b>CHAPTER V - IP Routing:</b> Introduction; IP routing process (packet creation, route tracking, route receipt, etc.); Routing Basics; Understanding of IP routing; Static and Dynamic Routing.	2	<b>Lab exercises through Cisco Packet Tracer software:</b> - Configuration of default route and static routes.	2
9	<b>CHAPTER VI - IP Routing Protocols:</b> Introduction; Basics of routing protocol; Administrative distance; Routing protocols classes; Vector distance routing protocols; RIP version 1; RIP Version 2; VLSM and separate networks; EIGRP; Border Gateway Protocol.	2	<b>Lab exercises through Cisco Packet Tracer software:</b> - Configuration of RIPv1 and RIPv2 protocols. - Configuration of EIGRP protocol.	2
10	<b>CHAPTER VI - IP Routing Protocols:</b> Link-State Routing Protocols; Open Shortest Path First (OSPF); Intermediate System to Intermediate System (IS-IS).	2	<b>Lab exercises through Cisco Packet Tracer software:</b> - Configuration of OSPF and IS-IS protocols.	2
11	<b>CHAPTER VII - TCP/IP Protocols:</b> Introduction; Application Layer Protocols (Telnet, FTP, SFTP, TFTP, NFS, SMTP, POP, IMAP 4, TLS, SIP (VoIP), RTP (VoIP), SNMP).	2	<b>Laboratory exercises through Cisco Packet Tracer software and Wireshark:</b> - Configuration and capture of network packets of servers, services, and protocols: FTP, SFTP, TFTP, NFS, and SMTP.	2
12	<b>CHAPTER VII - TCP/IP Protocols:</b> HTTP; HTTPS; IGMP; DNS; Dynamic Host Configuration Protocol (DHCP)/Bootstrap Protocol (BootP); Protocollet e shtresës Host-to-Host; Internet Control Message Protocol (ICMP);	2	<b>Laboratory exercises through Cisco Packet Tracer software and Wireshark:</b> - Configuration and capture of network packets of servers, services, and protocols: POP, IMAP 4, TLS, SIP (VoIP),	2

	Address Resolution Protocol (ARP); Reverse Address Resolution Protocol (RARP); Proxy Address Resolution Protocol (Proxy ARP).		RTP(VoIP), dhe SNMP.	
13	<b>CHAPTER VIII - IPv6:</b> Introduction; The problem with IPv4; Internet Protocol, version 6; Format of IPv6; Examples of IPv6; Configuring IPv4 and IPv6; The main commands for testing and network management (ping, telnet, ipconfig, ipconfig / all, tracert, nslookup, etc.	2	<b>Laboratory exercises through Cisco Packet Tracer software and Wireshark:</b> - Configuration and capture of network packets of servers, services, and protocols: HTTP, HTTPS, IGMP, DNS, DHCP, BootP, ICMP, ARP, RARP, Proxy ARP.	2
14	<b>CHAPTER IX - Switch and Router Configuration:</b> Commands and configuration procedures for switches and routers.	2	<b>Numerical exercises and laboratory exercises through Cisco Packet Tracer software:</b> IPv6 and IPv6 configuration in the existing topology.	2
15	<b>The second test</b>	2	<b>The second laboratory test</b>	2

<b>LITERATURE:</b>				
1. Sildet e ligjëratave 2. Todd Lammle; Network +; Deluxe Study Guide, 2009, 3. Shivendra S. Panwar, Shiwen Mao, Jeong-dong Ryoo dhe Yihan Li; TCP/IP Essentials, 4. Cambridge University, 2004				
<b>NOTICE:</b>				
<b>Notice for the student:</b>				