

Study program: Modern computer technologies			
Course title: Computer Networks			
Professor/assistant: Mirko Kosanovic / Dusan Stefanovic			
Type of course: compulsory			
ECTS credits: 7			
Pre-requisites: none			
Aims of the course: Acquisition of basic knowledge about the techniques and ways of networking computers.			
Learning outcomes: Preparing students for further study of network technology and individual connecting of computers.			
Syllabus <i>Theoretical part</i> Introduction to communication standards and protocols. Media transmission and data encoding. Analog and digital signals. Making the connection. Data compression. Network security in computer networks. Data protection (firewall, VPN and data encryption). Control data networks. Local area networks (Ethernet, Token Ring, and wireless networks). Connecting the network (repeaters, hubs, switches and routers). Network services (NetBIOS, NetBEUI, WINS, DNS, and DHCP). Network operating systems and protocols. Overview of Microsoft's Active Directory service. Network diagnostic, testing and maintenance. Introduction to the concrete realization of a computer network. <i>Practical part :</i> Getting different data coding (Morse code, ASCII, EBCDIC, and Unicode). Different schemes for digital encoding (NRZ, NRZI and Manchester), modulation type (amplitude, phase and QAM). Problems related to data compression (Huffman coding, arithmetic compression, run-length , Lempel - Ziv). Error detection by cyclic redundancy checks, Hamming codes. Algorithms for Data Encryption: Caesar and poly alphabetic encryption, and DES standards, public keys and digital signatures. Introduction to the media (serial cable, parallel cable, coaxial cable, fiber optic cable). Introduction to the devices for establishing a connection between computers (amplifier, hub, switch, router, bridge) and console commands to control and configure network devices from TCP/IP. Practical introduction to the program to simulate the operation of the network "CISCO Config Maker". Introduction to the network device, router and design of a small network and its testing through "CISCO Config Maker".			
Literature 1. Savremene komunikacione tehnologije i mreže, William A. Shay, Kompjuter biblioteka, Cacak, 2004. 2. Računarske mreže, Andrew Tanenbaum, Mikro knjiga , Beograd, 2005. 3. James F. Kurose, Keith W. Ross, Computer Networking: A Top-Down Approach Featuring the Internet, Addison Wesley.			
Number of active classes			Other forms of teaching:
Lectures: 45	Practical classes: 30	Research work:	
Teaching methods Combination of interactive approach with practical problem solving.			
Grading system (maximum 100 points), grading scale from 5 to 10: below 51 points grade 5, grade 6 from 51-60 points, grade 7 from 61-70 points, grade 8 from 71-80 points, grade 9 from 81-90 points, grade 10 from 91-100 points.			
Pre-exam obligations	points	Final exam	points
activity during theoretical lectures	10	written exam	15
practical training	20	oral exam	15
colloquium(s)/seminar papers	40		
Sum	70	Sum	30