Study program: Information Technology	
Course title: COMPUTER NETWORKS AND COMMUNICATIONS	
Teacher(s): Marjan D. Milošević, Uroš M. Pešović	
Course status: mandatory	
Number of ECTS credits: 6	
Prerequisite courses: none	

Course objectives

Getting to know the fundamentals computer networks, network topologies and the roles of the networked computers. Layered protocols architecture (ISO/OSI referent model); layers' roles and functions. Mastering basics of configuration and administering of local networks and network services.

Learning outcomes

It is expected from the student to:
- describe Internet achitecture and explain how key network protocols work
- analyse performances of computer network and specific network devices
- define functional requirements for computer network design
- administrate local area network, assess the network, analyse traffic and detect malfunctions

Content of the course

Theoretical teaching

Importance and application of computer communications. Concept of network and Internet. Concept of layered model (OSI, TCP/IP). Internet architecture. Network standardisation. Ways and means of information transfer (types of signals, means of signal transfer, codes for data transfer, data protection in transfer, errors detection and correction). Communication devices (modems, multiplexers, concentrators, bridges, switches, routers, gateways, interfaces). Mediums. Flow control (Stop'n'Wait, Slidin Window). HDLC, PPP. Media access control. Aloha, CSMA/CD, Ethernet. Networks with tokens. IP protocol. Routing protocols. TCP, UDP. Reliable transfer. Congestion control. Application layer protocols and P2P networks. Wireless networks. Multimedia transfer. Network security.

Practical teaching

Problem solving class, lab exercises in computer classroom. Protocol analysis using packet analysis software. Network simulations.

Literature

[1] J.F. Kurose, K.W. Ross: Umrežavanje računara: od vrha ka dnu, 7. izdanje, CET, Beograd, 2018, ISBN 978-86-7991-398-2

[2] А.С.Таненбаум, Рачунарске мреже, превод четвртог издања, Микрокњига, Београд, 2005, ISBN 86-7555-265-3

[3] М. Веиновић, А. Јевремовић: Увод у рачунарске мреже, Универзитет Сингидунум, 2008, ISBN 978-86-85891-018-2

[4] J.F. Kurose, K.W.Ross, Computer Networking: A Top-Down Approach, Eight Edition, Pearson, 2020, ISBN: 9780135928615

[5] P.L.Dordal, An Introduction to Computer Networks, 2023, free edition, available at:
https://intronetworks.cs.luc.edu/current2/ComputerNetworks.pdf

[6] Wenliang Du: Computer & Internet Security: A Hands-on Approach, Third Edition, 2022, ISBN: 978-1733003940

Number of active teaching classes: 4	**Theoretical teaching: 2**	**Practical teaching: 2**

Teaching methods

Internactive class (popular teaching, discussion, demonstration method), auditory exercises, individual experimentation.

Evaluation of knowledge (maximum number of points 100)

Pre-exam obligations	Points	Final exam	Points
Activities during teaching process	/	Final exam (written):	30
Practical teaching	20	Final exam (oral):	20
Colloquium	30		
Practical teaching	/		