Course Unit Descriptor

Study Programme: Information Technology – Software engineering

Course Unit Title: Communication and computer networks

Course Unit Code: OAS291

Name of Lecturer(s): Associate Professor Dalibor Dobrilović, PhD

Type and Level of Studies: Bachelor Academic Degree

Course Status (compulsory/elective): Compulsory

Semester (winter/summer): Winter

Language of instruction: English

Mode of course unit delivery (face-to-face/distance learning): Face-to-face

Number of ECTS Allocated: 7

Prerequisites: None

Course Aims:

The main goal of the course is mastering the basic principles and technologies in the field of communication and computer networks. In addition to training theoretical aspects, students are trained for practical work and application of the same technologies.

Learning Outcomes:

After a successfully mastered course, students become familiar with the basic topics in the field of communication and computer networks. In addition to training on theoretical aspects, students are trained for practical work, application and administration of such systems and technologies. By mastering knowledge through the work in real and virtual laboratory environments students gain theoretical and practical skills in configuring computer networks and communication protocols. The students are expected to master a certain degree of ability to work with modern communication and computer network technologies.

Syllabus:

Theory

Basic concepts of communication and computer networks. The general model of the communication system. Communication systems classification. OSI reference model. Harmonic analysis of periodic and aperiodic signals (Fourier series, transformation, integral, inverse transformation). Discretization of continuous signals. Analog and digital modulation. Data transmission systems: analog and digital. Standards for local computer networks (Ethernet, IEEE 802.11). Virtual LANs. Wireless personal networks WPANs (Bluetooth, Bluetooth LE, IEEE 802.15.4 and ZigBee). Introduction to TCP/IP protocol. VPN networks. Mobile communications of the second (2G), third (3G) and fourth generations (4G). Operating systems of mobile devices. Radio and satellite systems. Optoelectronic transmission systems.

Practice

Practical work covers laboratory exercises with solving tasks and practical problems and application examples with the use of computers and network devices, as well as software for simulation of communication and computer networks.

Required Reading:

1. Andy Bateman, Digital Communications, Design for the Real World, Addison Wesley Longman, Limited, Singapore, 1999,

2. William A. Shay, Understanding Data Communications and Networks, 2nd Edition, International Thomson Publishing, 1998.

3. John S. Seybold, Introduction to RF Propagation, John Wiley & Sons, New Jersey, USA, 2005.			
Weekly Contact Hours: 4	**Lectures:** 2	**Practical work: 2**	
Teaching Methods: Lectures and students group work			
Knowledge Assessment (maximum of 100 points): 100			
Pre-exam obligations	points	**Final exam**	Points
Active class participation	0	oral exam	30
Preliminary exam(s)	20		
Practical exam	30		
Seminar(s)	20		