Course title: Contemporary Modern network technologies

Teacher(s): Vladimir M. Mladenovic

Course status: elective

Number of ECTS credits: 10

Condition: Knowledge of computer networks at the level of undergraduate studies is desirable, as well as knowledge of Python or Java programming languages

Course objectives

The aim of the course is to learn in detail the principles and mechanisms of management of both classic computer networks and modern communication networks. Introduction to the mechanisms and methodology of modern computer systems management, which today includes complex activities on the boundaries between organizational management methods, software design components for traditional network management and wireless network management aspects. This is an area that is intensively developing and which is of special importance for the data center and the provision of various services with large data protocols. The course includes selected chapters of modern networks such as 4G and 5G, as well as Defined Networking Software (SDN).

Learning outcomes

Students gain knowledge about today's functioning, analysis and management of computer networks, which are current areas of research and potential development. The student is capable of managing and planning computer networks, either by developing applications that support individual processes of managing networks and network services.

Courses

Theoretical teaching

Review of the latest results in the field of computer vision through scientific papers.
Students get acquainted with new communication networks, their management, standards, ways of centralized and distributed management of computer networks, management of multi-domain network services, autonomous support. Students get acquainted with modern concepts of mobile 4G and 5G, as well as SDN, key research topics in these areas. They follow the trends of development and application of new communication networks, topologies and ways of protection of centralized and distributed management of computer networks, concepts of time network technologies, ways of their design, development and upgrade, apply global aspects of standardization of network technologies (new ISO / IEC projects). Potential directions of new research, top performance testing.

Practical teaching

Analysis and simulation of computer network performance through solving specific project problems.

Literature

[1] Nadeau T., Gray K., *SDN: Software Defined Networks*, O'Reilly Media, 2013
[2] 5G NR Architecture, Technology, Implementation, and Operation of 3GPP New Radio Standards, S.Ahmadi
[3] Скуп научних радова из релевантних области
[4] J. Rodriguez, Fundamentals of 5G Mobile Networks, 2015, John Wiley & Sons, Ltd.
[5] 5G Multimedia Communication Technology, Multiservices, and Deployment, CRC Press 2020, ISBN: 9780367178505

S. Miletic, I. Pokrajac, K. Pena, G. Arce, V. Mladenovic, A multigraph-defined distribution function in a simulation model of a communication network, A special issue of Entropy 2022, 24(9), 1294; https://doi.org/10.3390/e24091294, https://www.mdpi.com/1099-4300/24/9/1294

Number of classes of active teaching: 3	Theoretical teaching: 2	Practical teaching: 1

Teaching methods

Lectures, consultations. Study research.

Evaluation (maximum number of points 100)

Seminar paper - 20

Experimental research work with presentation - 30

Oral exam- 50