RTU Course "Computer Network Monitoring, Diagnostics and Maintenance"

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General data

Code	TRL534
Course title	Computer Network Monitoring, Diagnostics and Maintenance
Course status in the programme	Compulsory/Courses of Limited Choice
Responsible instructor	Elans Grabs
Academic staff	Aleksandrs Ipatovs Romans Jerjomins Daniils Aleksandrovs-Moisejs
Volume of the course: parts and credits points	1 part, 3.0 Credit Points, 4.5 ECTS credits
Language of instruction	LV, EN
Annotation	The study course learning is based on the classifications of computer networks control and diagnostic systems. Learning a variety of computer networks science and management processes, different diagnostical network tests, technical evaluation methods and software tools.
Goals and objectives of the course in terms of competences and skills	The aim of the study course is to demonstrate to students a current and next generation of computer network architecture, to present various control and management network techniques, to show modern diagnostic network technologies. The study course tasks: • to provide basic knowledge about network diagnostic, control and management techniques; • to explain the general computer network management and their problems; • to explain the current computer network diagnostic tools and control technologies; • to give an opportunity to assess the infrastructure and technology of various computer networks.
Structure and tasks of independent studies	To use interactive learning resources, in addiction study materials during the study course. In order to assess the achievement of the student's independent task, the participants of the study course every time organize lectures, laboratory and independent works.
Recommended literature	Obligātā/Obligatory: 1.Е.В. Смирнова, А.В. Пролетарский, Е.А. Ромашкина, С.А. Балюк, А.М. Суровов, «Технологии современных беспроводный сетей Wi-Fi», МГТУ им. Н.Э. Баумана, 2017 год, 446. Стр 2.2. Matthew G. Naugle, "Network Protocol Handbook", McGraw-Hill 1st edition, 1994, 521 p. 3.В. Г. Олифер, Н.А. Олифер, «Компьютерные сети. Принципы, технологии, протоколы: Юбилейное издание», 2020 год, 1008 стр. Papildu/Additional: 1.Oracle Corporation, "Oracle VM VirtualBox: User Manual", 2020, 397 p. 2.Adrian Mouat, "Using Docker: Developing and Deploying Software with Containers", 2016, 355 p. Citi informācijas avoti/Other sources of information: 1.https://docs.docker.com 2.https://tldp.org
Course prerequisites	Computer Networks Basics, Computer Learning.

Course contents

Content	Full- and part-time intramural studies		Part time extramural studies	
	Contact Hours	Indep. work	Contact Hours	Indep. work
Introduction to computer network science (monitoring, diagnostics and management).	2	2	0	0
Network diagnostic methods. Network theory basics.	4	4	0	0
Computer networks monitoring infrastructure.	5	5	0	0
Substantiation of network devices. Network device security.	4	4	0	0
Management and security types of network protocols.	4	4	0	0
Computer networks management basics. Networking standards.	5	5	0	0
Virtual Machine technologies. Cloud services. Linux operation system.	6	6	0	0
Basics of containerization.	7	7	0	0
Docker networking.	7	7	0	0
Docker containers management. Using Docker as network services.	7	7	0	0
Docker container operations diagnostic and monitoring.	4	4	0	0
Summary. Next generation of network types.	3	3	0	0
Final lecture. Future networking tasks.	2	2	0	0
Total:	60	60	0	0

Learning outcomes and assessment

Learning outcomes	Assessment methods
Knows the technologies of current computer networks, learn how to works networks protocols, perform diagnostic tasks with network.	Lectures. Practical and laboratory works.
Knows how to manage computer network architecture, protocols, standards, as well network switching variety.	Lectures. Practical and laboratory works. Tests.
Able to do the computer network management tasks. Learned the basics of network security control.	Lectures. Practical works.
Able to create a virtual machine and container models and knows how to analyse the container networking operation.	Lectures. Practical and laboratory works. Tests.
Capable of practice the use of materials that have been studied.	Exam.

Evaluation criteria of study results

Criterion	%
Lecture activity	10
Tests	40
Laboratory and practical works	20
Exam	30
Total:	100

Study subject structure

Part	CP	Hours per Week			Tests		
		Lectures	Practical	Lab.	Test	Exam	Work
1.	3.0	2.0	0.0	1.0		*	