COURSE UNIT DESCRIPTION

Course unit title	Course unit code
COMPUTER NETWORKS AND THEIR SECURITY	

Lecturer (s)	Department where course unit is delivered
dr. Mantas Vaitonis	Kaunas Faculty Institute of Social Sciences and Applied Informatics

Cycle	Level of course unit	Type of the course unit
First	1/1	Mandatory

Mode of delivery	Semester or period when the course unit is delivered	Language of instruction
Lectures, online lectures, practices	4 semester	Lithuanian/English

Requirements for the student	
Prerequisites:	**Requisites:**

Number of ECTS credits allocated	Student‘s workload	Contact work hours	Individual work hours
5	130	68	62

Aim of the subject: competencies to be developed in the study program		
Students will be able to install, configure, and diagnose a local computer network. Get to know and learn how to manage common local network resources. Ability to localize and troubleshoot local computer network failures.		
Learning outcomes of course unit	**Teaching and learning methods**	**Assessment methods**
Familiarity with computer network and data communication technology, ability to configure to test simple local area networks. Basic organization of work of network services. Monitoring and analyzing network traffic - and solving security problems.	Lectures, exercises, independent work active teaching / learning methods (network configuration, network modeling, simulation of possible network failures) flow monitoring, situation analysis	Case study, control works, practical works, exam

Course content: breakdown of the topics	Contact work hours							Individual work hours and tasks	
	Lectures	Consultations	Seminars	Practice classes	Laboratory	Practice	**All contact work**	**Individual work**	**Tasks**
Computer networks (LAN, MAN, WAN), computer network concept, network topologies and technology local network Configurations, firewall and access control.	2			4			6	4	Literature, cases study, discussions, practical tasks
OSI model and layer services, protocols, defining the communications subnetwork, defining the upper OSI layers.	2			4			6	5	Literature, cases study, discussions, practical tasks
Wired and wireless networks, recognizing wired networks and media types, understanding wireless networks.	2			4			6	5	Literature, cases study, discussions, practical tasks
Internet Protocol, IPv4 and IPv6.	2			4			6	10	Literature, cases study, discussions, practical tasks
Implementing TCP/IP in the command line, using basic and advanced TCP/IP commands, transport-level and web security.	2			4			6	10	Literature, cases study, discussions, practical tasks
Setting up common networking services, remote administration, defining name resolution technique, key distribution/management and authentication.	2			4			6	10	Literature, cases study, discussions, practical tasks
Wide area networks, technologies and connections, routing, quality of service (QoS).	2			4			6	10	Literature, cases study, discussions, practical tasks

Network infrastructures and network security, IPsec, VPN connections and authentication, security devices and zones.	2			4			6	12	Literature, cases study, discussions, practical tasks
Exam preparation, consultation		2					2	12	
Exam							2		
Total	16	2		32			52	78	

Assessment strategy	**Percentage**	**Date of examination on**	**Assessment criteria**
Control work (C1) from theory	10 %	Scheduled time	Evaluated on a scale of 1-10 grades: 10-9: Excellent knowledge and skills. Assessment level. 90-100 % correct answers. 8-7: Good knowledge and skills, there may be minor mistakes. Level of synthesis. 70-89% correct answers. 6-5: Average knowledge and skills, there are mistakes. Analyzes level. 50-69% correct answers. 4-3: Knowledge and skills are below average, there are (essential) errors. Level of knowledge application. 20-49% correct answers. 2-1: Minimum requirements not met. 0-19% correct answers.
Practical work (P1)	20 %	Scheduled time	Evaluated on a scale of 1-10 grades: 10-9: Excellent knowledge and skills. Assessment level. 90-100 % correct answers. 8-7: Good knowledge and skills, there may be minor mistakes. Level of synthesis. 70-89% correct answers. 6-5: Average knowledge and skills, there are mistakes. Analyzes level. 50-69% correct answers. 4-3: Knowledge and skills are below average, there are (essential) errors. Level of knowledge application. 20-49% correct answers. 2-1: Minimum requirements not met. 0-19% correct answers.
Individual work (I1)	20 %	Scheduled time	Evaluated on a scale of 1-10 grades: 10-9: Excellent knowledge and skills. Assessment level. 90-100 % correct answers. 8-7: Good knowledge and skills, there may be minor mistakes. Level of synthesis. 70-89% correct answers. 6-5: Average knowledge and skills, there are mistakes. Analyzes level. 50-69% correct answers. 4-3: Knowledge and skills are below average, there are (essential) errors. Level of knowledge application. 20-49% correct answers. 2-1: Minimum requirements not met. 0-19% correct answers.

Exam (E1)	40 %	Scheduled time	Students have to prepare individual project based on course material. Only if they fail this project, they can take exam on scheduled time which would cover the whole course material. Evaluated on a scale of 1-10 grades: 10-9: Excellent knowledge and skills. Assessment level. 90-100 % correct answers. 8-7: Good knowledge and skills, there may be minor mistakes. Level of synthesis. 70-89% correct answers. 6-5: Average knowledge and skills, there are mistakes. Analyzes level. 50-69% correct answers. 4-3: Knowledge and skills are below average, there are (essential) errors. Level of knowledge application. 20-49% correct answers. 2-1: Minimum requirements not met. 0-19% correct answers.
Final grade: 0.1*C1+0.2*P1+0.2*I1+0.4*E1			

Author	**Year**	**Title**	**Number of periodical publication or publication Volume**	**The place of publication and publisher or online link**
Required reading				
Douglas E. Comer.	2014	Computer Networks and Internets	(6th Edition)	Pearson. ISBN-10: 0133587932
Joel Tope	2015	How to Hack Computers: How to Hack Computers, Hacking for Beginners		Joel Tope
Andrew S. Tanenbaum and David J. Wetherall	2011	Computer Networks	(5th Edition)	
Recommended reading				
Charles M. Kozierok	2005	TCP/IP guide: a comprehensive, illustrated internet protocols reference		http://www.tcpipguide.com/free/index.htm
Ivan Marsic	2013	Computer Networks. Performance and Quality of Service		http://www.ece.rutgers.edu/~marsic/books/CN/book-CN_marsic.pdf