FACULTY OF ENGINEERING
STUDY COURSE DESCRIPTION

Course Title:	**DATA TRANSMISSION NETWORKS - II**
Course code (VAIS):	*The course will be registered in the study administration system after accreditation*
Study programme:	**Information Technologies**
Level of Study programme:	☒ 1st level professional higher education
	☒ Professional Bachelor
	☐ Professional Master
	☐ PhD level
Type of Study programme:	☒ Compulsory course (Part A)
	☐ Professional specialization courses (Part B, compulsory)
	☐ Professional specialization optional courses (Part B, optional)
	☐ Elective courses (Part C)

Course Workload:	Credits	ECTS	Academic hours	Contact hours	Independent work hours
Full time	2	3	80	32	48
Part time	2	3	80	10	70

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	Consultation: according to the schedule for each semester
Course Form:	Full time / part time
Study year, semester:	1st year, 2nd semester
Language:	Latvian, English
Prerequisites for the Course:	-
Course Summary:	The aim of this course is to give practical and theoretical knowledge in nowadays computer networks, to introduce the fundamentals of local and global networks, technologies, concepts, use cases, protocols and standards. During practical workshops students get practical skills in designing and configuring networks. This course serves as a preparation for Data Transmission Networks – III.
Assessment:	Examination
Requirements for Credits:	1. Passed each lecture's practical activity 2. Passed online tests for each chapter 3. Passed workshops and uploaded protocols 4. Final examination consists of oral questions and practical activity. If all requirements are not met on time, student is not allowed to pass exam. For delayed exam requirements, max score is decreased.
Abiding by the Academic Ethics	Students must abide by the academic and research ethics, Vidzeme University of Applied Sciences Ethics Regulations, incl.: − study papers must be independently developed; − the study work should reference all statements, ideas and data used that have been authored by someone else; − appropriate data acquisition methods should be used in the acquisition of data, the research ethics must be respected, empirical data must be collected independently and cannot be distorted or falsified; − the examination must be carried out by the student independently, without the use of supporting materials and/or consultations with other students, unless the lecturer states otherwise. In the event of non-compliance with the academic and research ethics, punishment is imposed in accordance with the ViA Ethics Regulations and the study course must be re-taken, unless the punishment is extramarital.

		Learning Outcomes	The evaluation methods and criteria
Learning Outcomes; the evaluation methods and criteria			
		Knowledge	
		Knowledge on nowadays network types and addressing.	Development of network simulation and passed online test.
		Knowledge on data transmission protocols, services and key elements.	Development of network simulation and passed online test.
		Knowledge on networking devices and diagnostics.	Development of network simulation and passed online test.
		Knowledge on data transmission network configuration baselines and consideration of cybersecurity issues.	Development of network simulation and passed online test.
		Skills	
		Skills to make main configuration of network services and verification.	Filled and uploaded workshop protocol.
		Skills to make diagnostics and debugging for running services, analyse network traffic.	Filled and uploaded workshop protocol.
		Skills to configure basic router parameters, plan and calculate IP addresses for network segments.	Filled and uploaded workshop protocol.
		Skills to design small networks and perform monitoring.	Filled and uploaded workshop protocol.
		Competency	
		Use correct network terminology. Choose appropriate services for specified network infrastructure.	Individual exam with oral questions and practical assessment.
		Independently design local area networks, plan IP addressing and perform configuration tasks.	Individual exam with oral questions and practical assessment.
		Solve data transmission network basic problems, perform diagnostics and debugging tasks in all OSI model layers.	Individual exam with oral questions and practical assessment.
Course Compulsory literature:	1. Cisco Networking Academy, CCNA Routing and Switching course Introduction to Networks and Routing & Switching Essentials, Interactive online tutorial, version 6, 2016.		
Course additional literature:	1. MikroTik Certified Network Associate (MTCNA) certification study material, 2015. 2. Andrew S. Tanenbaum, David J. Wetherall. Computer Networks (5th Edition). 960 pages. 2010.		
Course confirmation date:	08.12.2022		
Date of course description update:			

Study Course Plan for full time students:

Date	Theme	Academic hours		Study Form
		Contact hours	**Independent work hours**	
	IP addressing. Networks and end	4	6	Theoretical lecture. Practical activity.

Theme	Contact hours	Independent work hours	Study Form
devices. Necessity of Subnet mask and subnet calculations.			Online test. Skills challenging workshop.
Broadcast types and reserved addresses. IPv6 addresses. ICMP protocol and verification.	4	6	Theoretical lecture. Practical activity. Online test. Skills challenging workshop.
Network segments and making subnets. Subnetting scenarios and calculations. VLSM use cases and principles.	4	6	Theoretical lecture. Practical activity. Online test. Skills challenging workshop.
Transport layer protocols and their role. TCP and UDP protocols in communication process. Mechanisms for reliable data transmission.	4	6	Theoretical lecture. Practical activity. Online test. Skills challenging workshop.
Protocols and their relation to software. HTTP and HTTPS protocols. E-mail protocols. Operation of SMTP, POP3 and IMAP protocols. Importance of DNS and DHCP protocols, their operation and configuration. File transfer process, FTP and SMB protocols. Importance of encryption.	4	6	Theoretical lecture. Practical activity. Online test. Skills challenging workshop.
Importance of DNS and DHCP protocols, their operation and configuration. File transfer process, FTP and SMB protocols. Importance of encryption.	4	6	Theoretical lecture. Practical activity. Online test. Skills challenging workshop.
Designing a network. Network size and network security. Classification of attacks, vulnerabilities and device security.	4	6	Theoretical lecture. Practical activity. Online test. Skills challenging workshop.
Final examination	4	6	Final examination with oral questions and practical activity.
Hours total:	*32*	*48*	

Study Course Plan for part time students:

Date	Theme	Academic hours		Study Form
		Contact hours	Independent work hours	
	IP addressing. Networks and end devices.	1	9	Theoretical lecture. Practical activity. Online test. Skills challenging workshop.

Necessity of Subnet mask and subnet calculations.			
Broadcast types and reserved addresses. IPv6 addresses. ICMP protocol and verification.	1	9	Theoretical lecture. Practical activity. Online test. Skills challenging workshop.
Network segments and making subnets. Subnetting scenarios and calculations. VLSM use cases and principles.	1	9	Theoretical lecture. Practical activity. Online test. Skills challenging workshop.
Transport layer protocols and their role. TCP and UDP protocols in communication process. Mechanisms for reliable data transmission.	1	9	Theoretical lecture. Practical activity. Online test. Skills challenging workshop.
Protocols and their relation to software. HTTP and HTTPS protocols. E-mail protocols. Operation of SMTP, POP3 and IMAP protocols. Importance of DNS and DHCP protocols, their operation and configuration. File transfer process, FTP and SMB protocols. Importance of encryption.	1	9	Theoretical lecture. Practical activity. Online test. Skills challenging workshop.
Importance of DNS and DHCP protocols, their operation and configuration. File transfer process, FTP and SMB protocols. Importance of encryption.	1	9	Theoretical lecture. Practical activity. Online test. Skills challenging workshop.
Designing a network. Network size and network security. Classification of attacks, vulnerabilities and device security.	1	9	Theoretical lecture. Practical activity. Online test. Skills challenging workshop.
Final examination	3	7	Final examination with oral questions and practical activity.
Hours total:	*10*	*70*	