

Subject code	Credits
INF3001	6

Title

KOMPIUTERI TINKLAI

Title in English

COMPUTER NETWORKS

Subject goal and annotation

Course introduces main concepts of networking; application areas; classification; network architecture and protocols; computer network design methods, implementation and maintenance principles; data transmission environments and technologies; network security and management; communication networks development perspectives.

Prerequisites

Computer architecture and operating systems

Relationship between the learning outcomes of the Programme and learning outcomes of the subject

Learning outcomes of the Programme	Learning outcomes of the subject	Criteria for measuring the achievement of learning outcomes
3. Knowledge of basic and advanced computer science and its application.	<p>Knowledge about computer network architecture, topologies, protocols and standards.</p> <p>Basic knowledge about computer network design, implementation and network operating principles.</p> <p>Knowledge about data transfer environments and technologies.</p>	<p>Understands and characterizes computer network architecture, topologies, data transfer environments, technologies, protocols, methods, algorithms and standards.</p> <p>Knows computer network design and implementation stages as well as the principles of network operation.</p>
10. Analysis, design and development of advanced Internet systems.	<p>Design of different size, technology and specification level virtual network models. (working with OPNET IT Guru Academic Edition package)</p> <p>Model and analyze behaviour of entire network or its elements, observing chosen network operation parameters. (working with OPNET IT Guru Academic Edition package)</p>	<p>Are able to create virtual network models of different size and specification level and to perform network performance analysis, monitoring selected parameters using the OPNET IT Guru Academic Edition Package and explain modelling results</p>
12. Analysis, design and development of diverse software systems.	<p>Evaluate application's performance across network; investigate data flows; analyze network resources utilization, results of routing algorithms. (working with OPNET IT Guru Academic Edition package)</p>	<p>Are able to evaluate application's performance, investigate data flows, analyze network resources utilization, understand routing algorithms and protocols using the OPNET IT Guru Academic Edition Package and explain modelling results.</p>
17. Personal development skills - planning of studies based on the personal needs and tendencies in industry.	<p>Acquire practical skills of working with network equipment (D-Link).</p>	<p>Are able to perform basic switch configuration and management functions, know switch capabilities in network monitoring and meaning of various parameters.</p>

Subject content

	Lecture topics and contents	Hours
1.	Computer networks definition, main concepts, application areas, classification	3
2.	Computer networking architecture, protocols, standards, types of services, functions	6
3.	Computer network design methods, implementation and maintenance principles	3
4.	Data transmission environments and technologies, network equipment	6
5.	IP protocol. Addressing and routing on the Internet	6
6.	UDP and TCP protocols; principles of reliable data transfer	6
7.	Network applications and protocols	6
8.	Computer network security	3
9.	Computer network management	3
10.	Communication networks development perspectives	3
	Total	45

Practical work contents

Two groups of practical works:

1. Design virtual network models of different size, technology and specification level; model and analyze behaviour of entire network or its elements, observing chosen network operation parameters; evaluate application's performance across network; investigate data flows; analyze network resources utilization, results of routing algorithms (working with OPNET IT Guru Academic Edition package).

2. Acquire practical skills of working with network equipment (D-Link).

Evaluation of study results

Final written exam (50%), mid-term written exam (17%), and assessments of laboratory (practical) work (33%).

Distribution of subject study hours

Lectures	45
Laboratory work	30
Individual work (including homework, preparation for laboratory works, midterm and final exams)	81
Total	156

Recommended literature

No	Authors of publication and title	Number of copies available		
		<i>in the Library of VMU</i>	<i>in specialized publication collections at VMU</i>	<i>in other libraries</i>
Basic materials				
1.	James F. Kurose, Keith W. Ross. Computer Networking: A Top-Down Approach. . Addison-Wesley, 2008 (4 edition); 6 edition . 2013.		1 (2008)	
2.	Larry L. Peterson, Bruce S. Davie. Computer Networks: A Systems Approach, 2007. (4 edition)		1	
3.	William Stallings. Data and Computer Communications, 2007. (8 edition)		1	
4.	R.Valteryt . Computer Networks, 2007 (in Lith.)	10		
5.	E.Smirnova, A.Proletarsky, I.Baskakov, R.Fedotov. Switching Technologies in Modern Ethernet Networks. D-Link Academy, 2011.		1	
6.	Charles M. Kozierok. TCP/IP guide: a comprehensive, illustrated internet protocols reference, 2005.			http://www.tcpipguide.com/free/index.htm
Supplementary materials				
1.	D. Teare, C. Paquet. Campus Network Design Fundamentals, 2005.	1		

Subject prepared and coordinated by

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