

(faculty stamp)

COURSE DESCRIPTION

Z1-PU7

WYDANIE N1

Strona 1 z 2

1. Course title: COMPUTER NETWORKS		2. Course code: CN		
3. Validity of course description: 2015/2016				
4. Level of studies: BSc programme				
5. Mode of studies: intramural studies				
6. Field of study: INFORMATICS				AEI
7. Profile of studies: COMPUTER SCIENCE				
8. Programme:				
9. Semester: 5,6				
10. Faculty teaching the course: Institute of Informatics, RAu2				
11. Course instructor: dr hab. inż. Adam Domański				
12. Course classification:				
13. Course status: required				
14. Language of instruction: English				
15. Pre-requisite qualifications: Fundamentals of Computer Science				
16. Course objectives:				
The aim of the course is to familiarize students with the principles of designing communication protocols and the construction and operation of computer networks. Solutions for data link, network and transport link layers will be presented as well as basic functions of the higher layers of the ISO model. For the Internet, rudiments for the implementation of basic network services (dns, mail, http) will be presented.				
17. Description of learning outcomes:				
Nb.	Learning outcomes description	Method of assessment	Teaching methods	Learning outcomes reference code
1.	Understanding the operation of linear layers communication protocols, methods of ensuring reliable data transmission through unreliable links and flow control methods. Understanding fundamentals of communication in a computer system	Final test	Lecture	K1_W08, K1A_U01
2.	He has detailed knowledge of how to configure the computer's IP addressing, IP address relationships with the physical address and how to check them	Final test	Lecture, Laboratory	K1_W08, K1A_U19
3.	Students have basic knowledge of the principles of computer network operation, network operation modes and methods for determining and monitoring the route of packet transmission.	Final test	Lecture, Laboratory	K1_W08, K1A_K04
4.	Students understand the principles of information transport in the network, algorithms to prevent overload and control the quality of services	Final test	Lecture, Laboratory	K1_W08
5.	Student has basic knowledge of algorithms, protocols and standards related to the typical network services (DNS, e-mail, website).	Final test, Laboratory exercise	Lecture, Laboratory	K1_W13, K1A_U19, K1A_K02
6.	Student knows and understands the basic mechanisms of the local network.	Final test, Laboratory exercise	Lecture, Laboratory	K1_W08
18. Teaching modes and hours				
2	- - - -	sem 5		
-	- 2 - -	sem 6		

19. Syllabus description:**Lectures:**

Problems of transferring information between computers, the concept of transmission channel, communication protocol, transmission handling algorithms, information character processing, network services. Logical architecture of computer networks, OSI ISO system reference model, division of tasks into layers, layer functions, inter-layer communication (interface), data units, layer services, service delivery models, addressing.

Physical layer functions, Line layer tasks, character organization protocols, bit organization, methods for obtaining reliable transmission in the presence of interference, modem protocols. Local network channels, link access problem, rival access algorithms, token assignment, cycle planning. Local area network infrastructure, management, VLAN networks.

Network of transmission channels, operating modes, network topology, network layer tasks, network addressing, road selection algorithms, mechanisms of adaptation to topology changes, network load. Distance Vector protocols, Link State, hierarchical route selection, examples of protocols (rip, ospf, bgp), network cooperation with different transmission organization.

Information transport, organization of transmission, addressing, synchronization of network end stations, connection modes, connectionless, quality of service (QoS). Problem of handling interruptions in transmission, tasks of the session layer, mechanisms of session state registration, error recovery. Processing of forms and structures of information data, ASN-1 notation, protection of information security.

Examples of wide area network architectures - XNS, Internet (TCP / IP). Construction and functions of protocols, network addressing, auxiliary protocols (DNS, ARP, ICMP), transport layer algorithms. Local network architecture - NetBIOS protocol, addressing rules, SMB protocol.

Network operating systems, client-server systems, peer-to-peer, addressing access to services, security. Unix communication, rpc, ftp, telnet, smtp, http services. Windows system, NetBEUI protocol, network environment, drive mapping, resource sharing in the network (folders, printers), access rights system.

Laboratory:

The subject of the laboratory presents the basic issues related to network communication, principles of their configuration and network monitoring tools available in network operating systems. As part of individual exercises, students configure and test the operation of individual protocols and network services that use them.

The rules of communication in IP networks

Software interface of the TCP / IP stack

System name translation services

Wide area network routing protocols

Local network infrastructure

The Windows network environment

20. Examination: none

21. Primary sources:

1. Tanenbaum A., *Sieci komputerowe*, Helion 2004
2. Kurose J., Ross K., *Sieci Komputerowe. Ujęcie całościowe*, Helion 2010

22. Secondary sources:

1. Douglas E. Comer, *Sieci komputerowe i intersieci*. Helion, 2011
2. Haugdahl S., *Diagnostowanie i utrzymanie sieci. Księga eksperta*, Helion 2001

23. Total workload required to achieve learning outcomes

Lp.	Teaching mode :	Contact hours / Student workload hours
1	Lecture	30/30
2	Classes	30/30
3	Laboratory	/
4	Project	/
5	BA/ MA Seminar	/
6	Other	/
	Total number of hours	60/60

24. Total hours: 120

25. Number of ECTS credits: 4

26. Number of ECTS credits allocated for contact hours: 2

27. Number of ECTS credits allocated for in-practice hours (laboratory classes, projects): 2

26. Comments:

Approved:

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(date, Instructor's signature)

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(date, the Director of the Faculty Unit signature)