

<b>STUDY MODULE DESCRIPTION FORM</b>		
Name of the module/subject <b>Computer Networks</b>		Code <b>1010802111010822873</b>
Field of study <b>Electronics and Telecommunications</b>	Profile of study (general academic, practical) <b>general academic</b>	Year /Semester <b>1 / 1</b>
Elective path/specialty <b>Information and Communication</b>	Subject offered in: <b>English</b>	Course (compulsory, elective) <b>elective</b>
Cycle of study: <b>Second-cycle studies</b>	Form of study (full-time, part-time) <b>full-time</b>	
No. of hours Lecture: <b>2</b> Classes: <b>2</b> Laboratory: <b>-</b> Project/seminars: <b>-</b>		No. of credits <b>5</b>
Status of the course in the study program (Basic, major, other) <b>major</b>		(university-wide, from another field) <b>from field</b>
Education areas and fields of science and art <b>technical sciences</b> <b>Technical sciences</b>		ECTS distribution (number and %) <b>5 100%</b> <b>5 100%</b>
<b>Responsible for subject / lecturer:</b>  dr inż. Janusz Kleban email: janusz.kleban@put.poznan.pl tel. (061) 665-3929 Wydział Elektroniki i Telekomunikacji ul. Piotrowo 3, 60-965 Poznań		
<b>Prerequisites in terms of knowledge, skills and social competencies:</b>		
1	<b>Knowledge</b>	Has a systematic knowledge of computer architecture. [K1_W13]. Knows the principle of operation of digital transmission systems, including baseband transmission, signal transmission in channels, signal reception, countering channel distortions. [K1_W15].
2	<b>Skills</b>	Is able to extract information from Polish or English language literature, databases and other sources. Is able to synthesize gathered information, draw conclusions, and justify opinions. [K1_U01].
3	<b>Social competencies</b>	Is aware of the limitations of his/her current knowledge and skills; is committed to further self-study. [K1_K01]
<b>Assumptions and objectives of the course:</b> To provide students with the knowledge concerning development of technologies employed in computer networks. Knowing and understanding basic terms and networking mechanisms used to build and maintain local area networks, metropolitan area networks, and wide area networks.		
<b>Study outcomes and reference to the educational results for a field of study</b>		
<b>Knowledge:</b>		
1. Knows and understands the technical meaning of the terms describing computer networks. Has a basic, systematic knowledge of structure, operation and standards related to various types of computer networks. - [K1_W22]		
2. Has knowledge concerning operation, configuration and exploitation of basic devices used in computer networks. - [K1_W20]		
3. Knows and understands the technical meaning of the terms describing computer networks. Has a basic, systematic knowledge of structure, operation and standards related to computer networks. - [K1_W22]		
<b>Skills:</b>		
1. Is able to configure devices and launch a local computer network. Is able to configure routing protocols. Is able to use applications analyzing traffic in LANs and applications enabling secure data transmission. - [K1_U25]		
2. Is able to select networking devices for local area networks according to technical requirements and service conditions. - [K1_U21]		
3. Is able to properly use terms related to computer networking. - [K1_U02]		
4. Is capable of studying autonomously computer networking issues. - [K1_U05]		
<b>Social competencies:</b>		

1. Is aware of the impact electronics and ICT systems and networks will have on the development of the information society. - [K1\_K04]  
 2. Demonstrates responsibility and professionalism in solving technical problems. Is able to participate in collaborative projects. - [K1\_K02]

### Assessment methods of study outcomes

Formative Assessment:

Laboratory: Classes passing based on written tests and reports on carried out exercises.

Summative Assessment:

Lectures: Written exam from theory and content of the lectures. Test with open questions, range of scores for each question: 0, 0,5 lub 1. In order to pass the exam, total score needs to be at or above the point required for passing. Overall pass mark - more than 50% of total score. The exam may be taken after labs passing.

### Course description

Lectures:

The history of networking technologies development. The OSI Reference Model and TCP/IP protocol stack. The development and practical applications of Ethernet standards (100 Mbps, 1 GbE, 10 GbE). The structure and operation of Ethernet switches. Generic cabling system. The VLAN networks: fundamentals of operation and configuration. Token Ring and FDDI networks. Hardware and protocols for WLAN. Technologies for IP wide area networks. IP, TCP and UDP protocols. Routing protocols. The structure and operation of routers and firewalls. The VPN networks: classification, protocols used in VPN, VPN in practice. Core networks: ATM, MPLS, optical transmission in core networks. Access networks.

Laboratory:

The structure and operation of Ethernet networks - LAN (configuration of Cisco switches, the Ethernet-switches operation analysis, analysis of Ethernet-frames using Wireshark software, VLAN configuration, IP addressing system, configuration of DHCP server, NAT/PAT mechanisms). LAN networks networking (Cisco routers configuration, subnetting with a fix-length subnet mask, routing protocols: RIP, IGRP, RIPv2, static routing, subnetting with a variable-length subnet mask).

#### Basic bibliography:

1. A.S. Tannenbaum, Computer networks, PEARSON, 2011.
2. . K. Nowicki, J. Woźniak, Sieci LAN, MAN i WAN - protokoły komunikacyjne, Wydawnictwo Fundacji Postępu Telekomunikacji, Kraków, 2001

#### Additional bibliography:

1. Cisco Networking Academy Program CCNA 1 and 2 Companion Guide
2. Ch. Huitema, Routing in the Internet, Prentice Hall PTR, New Jersey, 2001

### Result of average student's workload

Activity	Time (working hours)
1. Participation in lectures	30
2. Participation in laboratory classes	30
3. Preparation for laboratory classes	25
4. Preparation for lectures	15
5. Preparation for the exam	20
6. Passig the exam	3
7. Discussion on exam results	2

### Student's workload

Source of workload	hours	ECTS
Total workload	125	5
Contact hours	75	2
Practical activities	60	1