

FACULTY ELECTRONICS					
<b>SUBJECT CARD</b>					
Name of subject in Polish:		<b>Sieci komputerowe</b>			
Name of subject in English:		<b>Computer Networks</b>			
Main field of study (if applicable):		<b>Electronic and Computer Engineering</b>			
Specialization (if applicable):		.....			
Profile:		<b>academic</b>			
Level and form of studies:		<b>1 st level/ full-time</b>			
Kind of subject:		<b>obligatory</b>			
Subject code:		<b>ECEA00101</b>			
Group of courses:		<b>YES</b>			
	Lecture	Classes	Laboratory	Project	Seminar
Number of hours of organized classes in University (ZZU)	30		30		
Number of hours of total student workload (CNPS)	60		60		
Form of crediting	crediting with grade		crediting with grade		
For group of courses mark (X) final course	<b>X</b>				
Number of ECTS points	<b>4</b>				
including number of ECTS points for practical (P) classes			2		
including number of ECTS points corresponding to classes that require direct participation of lecturers and other academics (BU)	1		1		

**PREREQUISITES RELATING TO KNOWLEDGE, SKILLS AND OTHER COMPETENCES**

**SUBJECT OBJECTIVES**

C1 To gain basic knowledge in the field of computer networks including applications and role in the modern world, technologies and protocols

C2 To gain practical knowledge and skills in construction, design and configuration of computer networks, analyzing of network traffic

C3 To gain and enforce social competences including the idea of normalization and certification in the field of computer networks

### SUBJECT EDUCATIONAL EFFECTS

relating to knowledge:

PEU\_W01 The course results with a student's ability to explain and describe basic information in the field of computer networks including applications and role in the modern world

PEU\_W02 The course results with a student's ability to explain and describe basic standards of computer networks including cables, technologies and protocols

PEU\_W03 The course results with a student's ability to explain and describe basic information related to design and configuration of computer networks

relating to skills:

PEU\_U01 The course results with a student's ability to construct and configure a simple computer network including design of IP addressing, to use diagnostic tools

PEU\_U02 The course results with a student's ability to use a network protocol analyzer

PEU\_U03 The course results with a student's ability to configure and manage popular network services

### PROGRAMME CONTENT

Lecture		Number of
Lec 1	Introduction to computer networks	2
Lec 2	Protocols and layers	2
Lec 3	TCP/IP layered model	2
Lec 4	IPv4 Addressing	2
Lec 5	Medium Access Control (MAC)	2
Lec 6	Ethernet and Switching	2
Lec 7	Internet Protocol	2
Lec 8	Subnetting and routing	2
Lec 9	Transport Layer3	3
Lec 10	Application Layer3	3
Lec 11	Physical Layer and Transmission Media	2
Lec 12	Virtual LANs	2
Lec 13	Network security essentials	2
Lec 14	Review of examination issues	2
	Total hours	<b>30</b>
Laboratory		Number of hours
Lab 1	Organizational information, rules of laboratory, rules of grading. Presentation of laboratory tools.	2
Lab 2	Connecting devices into computer network. Checking the correctness of network operation. diagnostic tools.	2
Lab 3	Application-layer network services (http, ftp, dns), domain name system and address translation process.	2
Lab 4	Analysis of header structure and operation of transport-layer protocols – using network analyzer. Identification and analysis of transport-layer sessions – at workstation level.	2

Lab 5	Analysis of header structure and operation of network-layer protocols using network analyzer. Addressing schemes in computer networks. Diagnostics of networks. Basis of path determining (routing) in computer networks. Remote work with remote terminal protocol.	4
Lab 6	Analysis of header structure and operation of data-link-layer protocols using network analyzer. Addressing rules at data link layer.	2
Lab 7	Ethernet technology, switching rules in Ethernet networks. Address resolution protocol.	2
Lab 8	Implementation of computer networks using switches and routers. Basic configuration of network devices.	2
Lab 9	Implementation of computer networks and configuration of network devices in network simulator. Simulation and correctness verification of network operation.	2
Lab 10	Implementation of computer networks and configuration of network devices. Correctness verification of network operation, solving typical configuration problems.	4
Lab 11	Individual practical assignment – implementing of small computer network	4
Lab 12	Review: network architectures, roles and protocols of network layers, communication rules in computer network.	2
	Total hours	<b>30</b>

#### TEACHING TOOLS USED

- N1. Lecture with multimedia presentations.  
N2. Problem-oriented lecture  
N3. Discussion  
N4. Practical tasks in laboratory  
N5. Tests on e-learning platform  
N6. Consultation  
N7. Own work – preparation to lecture, laboratory.

#### EVALUATION OF SUBJECT LEARNING OUTCOMES ACHIEVEMENT

Evaluation (F – forming (during semester), P – concluding (at semester end))	Learning outcomes code	Way of evaluating learning outcomes achievement
F1	PEU_W01 – PEU_W03	Test, oral exam
F2	PEU_U01 – PEU_U03	Test, evaluation of laboratory tasks, reports, e-learning tests
P = 0,5 *F1 + 0,5*F2, concluding grade may be passive subject to F1 and F2 are passive		

<b>PRIMARY AND SECONDARY LITERATURE</b>
<b><u>PRIMARY LITERATURE:</u></b> [1] Tannenbaum A., S., Computer Networks, Prentice Hall 5 <sup>th</sup> edition, 2010 [2] Kurose J., Ross K., Computer Networking: A Top-Down Approach, Pearson, 2016 [3] West J., Andrews J., Dean T., Network+ Guide to Networks, Course Technology, 2018 [4] Cisco <a href="http://netacad.com">netacad.com</a> materials
<b><u>SECONDARY LITERATURE:</u></b> [1] RFC (ang. Request for Comments) standards <a href="http://www.ietf.org">www.ietf.org</a> [2] IEEE (ang. Institute of Electrical and Electronics Engineers) standards <a href="http://www.ieee.org">www.ieee.org</a> [3] Network Journal [4] Materials of computer network devices and software vendors
<b>SUBJECT SUPERVISOR (NAME AND SURNAME, E-MAIL ADDRESS)</b>
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