COURSE DESCRIPTION CARD - SYLLABUS

Course name
Introduction to computer networks [S1MiKC2>WdSK]

Course

Field of study
Microelectronics and Digital Communication

Year/Semester
1/1

Area of study (specialization)
–

Profile of study
general academic

Level of study
first-cycle

Course offered in
Polish

Form of study
full-time

Requirements
compulsory

Number of hours

Lecture
15

Laboratory classes
15

Other
0

Tutorials
0

Projects/seminars
0

Number of credit points

2,00

Coordinators

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Lecturers

Prerequisites

The student starting this course should have a basic knowledge of the structure and operation of a computer and should know the binary and decimal number representation system. Should have the ability to convert decimal numbers to binary and vice versa, be able to obtain knowledge from indicated sources and be ready to cooperate as part of the team.

Course objective

The aim of the course is to provide students with basic knowledge of the mechanisms used in computer networks, with particular emphasis on protocols and services used on the Internet. Developing students' skills in solving problems arising in the process of configuring network device parameters.

Course-related learning outcomes

Knowledge:
1. Has a systematic basic knowledge of the structure, operation and standards of computer networks.
2. Has knowledge of the use and configuration of basic devices used in computer networks.
3. Knows the terms characterizing computer networks and understands the technical meaning of these terms.

Skills:
1. Is able to use network diagnostic tools available in the computer operating system.
2. Is able to configure network devices in terms of basic network services.
3. Can correctly use concepts related to computer networks.

Social competences:
1. Is aware of the need for a professional approach to solving technical problems and taking responsibility for the technical solutions he proposes.
2. Understands the impact of own work on the team's results and the need to comply with the principles of teamwork and take responsibility for jointly performed tasks.
3. Knows the limitations of his own knowledge and skills, understands the need for further education.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

The knowledge gained from lectures is assessed through a final assessmentm, in the form of a multiple-choice test, containing at least 40 questions covering the issues discussed during the lectures. Questions can be scored differently depending on the number of correct answers. Exam completion threshold: 50% of points (dst grade). The grading scale complies with the percentage division, i.e. from 60% of points - dst plus grade, 70% of points - db grade, etc. As a help in preparing for the exam, students receive a set of slides presented during lectures and a set of issues facilitating preparation for the exam. Laboratory: on the basis of at least four short (approx. 10 min.) tests, final test and reports. Passing threshold: 50% of the points obtained from all tests. It is also required to pass the reports from all exercises. Students are required to complete all laboratory exercises. Passing is done by the teacher b y checking the correctness of the exercise, e.g. by checking the correctness of network devices configuration and asking questions about the exercise being carried out. Failure to pass the exercise results in the necessity to repeat it on the date indicated by the teacher. Each student is required to upload a report on each exercise to the eKursy platform. Reports are subject to credit. Failure to pass even one report makes it impossible to obtain a credit for the course. Re-uploading the rejected report to the system, without making any corrections indicated by the teacher, will result in a reduction of the pool of points obtained by 3 points. Each report uploaded to the system after the date specified by the teacher will reduce the pool of points by 3 points.

Programme content

The course covers the following topics: computer network components, packet switching, network layer models, MAC and IP addresses, network equipment, protocols: IP, TCP and UDP, router configuration commands.

Course topics

Lecture:
1. Organizational issues related to the course: course program, rules for passing classes and literature. Basic concepts and components of computer networks. Development of ICT networks and network mechanisms.
2. Layered protocol systems: OSI and TCP/IP model.
3. MAC and IPv4 addresses. Transmission of frames and packets over the IP network. Domain addresses, DNS. Delay, packet loss, throughput in packet-switched networks. ICMP protocol.
4. Access networks, Ethernet standard. Structured cabling system: standards, elements, transmission media.
5. Basic functions of network devices (regenerators, bridges, switches, routers).
6. Analysis of protocols: IP, TCP and UDP, with particular emphasis on the content of packet headers of each protocol.
Laboratory:
1. Basics of IP addressing. Network and broadcast addresses, host addresses. Subnetting.
2. Network tools available in the operating system.
3. Analysis of network protocols (Wireshark).
4. Basic applications and functionality of network devices (CPT).
5. Commands for configuring routers, configuring routers and checking the correctness of the

configuration.
6. Repeating exercises that have not been passed.

Teaching methods

Lecture: conventional with the use of multimedia presentation available for students; additional examples are provided on the blackboard.
Laboratory exercises: the introduction to selected exercises is carried out by means of a multimedia presentation and examples provided on the blackboard. Each of the exercises has an instruction, according to which students carry out individual exercises. The instructions also contain additional questions related to the study topics.

Bibliography

Basic:
1. J. Kleban, Introduction to computer networks - slides for lectures
2. J.F. Kurose, K.W. Ross: Sieci komputerowe. Ujęcie całościowe, Wydanie VII, Helion, Gliwice, 2017
3. A.S. Tannenbaum, D.J. Wetherall: Sieci komputerowe, Helion, Gliwice, 2012

Additional:
1. K. Nowicki, J. Woźniak: Sieci LAN, MAN i WAN - protokoły komunikacyjne, Wydawnictwo Fundacji Postępu Telekomunikacji, Kraków, 2001
2. R. Pawlak, Okablowanie strukturalne sieci. Teoria i praktyka, Wydanie III, Helion, Gliwice, 2011.
3. Akademia sieci Cisco: Cisco Systems, INC.: autoryzowany podręcznik programu Cisco Networking Academy, red. Vito Amato; współpr. Wayne Lewis ; przekł. z jęz. ang. Wiesława Jachymczyk, Krzysztof Turczyński.

Breakdown of average student's workload

	Hours	ECTS
Total workload	60	2,00
Classes requiring direct contact with the teacher	30	1,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	30	1,00