COURSE DESCRIPTION CARD - SYLLABUS

Course name
Computer networks 2 [N1Inf1>SK2]

Course

Field of study
Computing

Year/Semester
3/5

Area of study (specialization)
–

Profile of study
general academic

Level of study
first-cycle

Course offered in
Polish

Form of study
part-time

Requirements
compulsory

Number of hours

Lecture
16

Laboratory classes
24

Other
0

Tutorials
0

Projects/seminars
0

Number of credit points

5,00

Coordinators

dr inż. Tomasz Bilski
tomasz.bilski@put.poznan.pl

Lecturers

Prerequisites

Knowledge: Student starting this module should have basic knowledge regarding computer systems organization, algorithms and data structures, operating systems, and computer networks 1. Skills: He/she should have skills allowing formulation of algorithms and their programming with the use of at least one widely used software tool. He/she should have skills that are necessary to acquire information from given sources of information. Student should understand the need to extend his/her competences and should express cooperativeness in a team. Social competencies: In addition, in respect to the social skills the student should show attitudes as honesty, responsibility, perseverance, curiosity, creativity, manners, and respect for other people.

Course objective

1. Provide students" knowledge regarding computer networks, within the scope of using, configuration, design and programming of local area and wide area networks, and cognition of technical solutions applied in these networks. 2. Develop students" skills in solving simple problems related to the use and configuration of computer networks. 3. Develop students" skills in team work, especially in configuration, design, and programming of technical solutions applied in computer networks.

Course-related learning outcomes

Knowledge:
1. have well-ordered, theoretically based general knowledge on networking technologies - [K1_W4]
2. have knowledge on important directions of computing science, and other related fields of science, especially electronics, telecommunications, and automatics and robotics - [K1_W5]
3. have basic knowlegle about cycle of life of computing science systems, both hardware and software ones, and especially on processes occuring in them - [K1_W6]
4. Knows basic techiques, methods and tools used in a process of solving of computing science tasks, mainly engineering ones, from the field of key issues in computing science - [K1_W7]

Skills:
1. is able to perform the critical analysis of the way of functioning of computing systems and other computing technical solutions an evaluate these solutions, especially: is able to participate in the software inspection and evaluate software architecture from th point of view of non-functional requirements, and is able to systematic performing of functional tests - [K1_U9]
2. is able - according to given specification - to design connection schema, connect and configure selected items of computer network, using appropriate methods, techniques and tools - [K1_U10]
3. is able to formulate and program algorithms used in computer networks with the use of at least one from popular tools - [K1_U11]
4. is able to secure data against unauthorized access - [K1_U12]
5. is able to organize, cooperate, and work in a team, accepting various roles in it, and is able to define accordingly the priorities used to the implementation of given task from the area of computer networks - [K1_U18]

Social competences:
1. understands that in computing science both knowledge and skills very quickly become out-of-date - [K1_K1]
2. is aware of the meaning of knowledge in solving engineering problems and knows the examples and understands the reasons of malfunctioning computing systems, which led to serious financial and social losses or to the serious loss of health, or even life - [K1_K2]
3. is able to think and act in an enterprising manner, e.g. finding commercial applications for created software, taking into account not only business benefits, but also social benefits of the performed activity [K1_K3]

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Learning outcomes presented above are verified as follows:
Formative assessment:
a) lectures:
- students activity during classes,
b) laboratory classes:
evaluation of doing correctly assigned tasks,
Total assessment:
a) verification of assumed learning objectives related to lectures:
i. based on the sum of answers and the activity during lectures.
ii. evaluation of student"s knowledge and skills obtained in lectures based on written exam with open questions. In order to obtain positive note, the
student should obtain more than 50% of maximum number of points. During the test, student cannot use any lecture notes, books, etc.
b) verification of assumed learning objectives related to laboratory classes:
i. evaluation of student"s skills related to carrying out the lab tasks, configuration task, and final project,
ii. monitoring student"s continuing activities during classes,
iii. evaluation of student"s skills based on one or two tests, covering from 10 to 15 questions.

Programme content

The module consists of the following topics:
Application layer TCP/IP protocols.
Elements of the management process:

Network redundancy
Elements of computer network documentation.
Basic tools and protocols for network management

Course topics

The lecture consists of the following topics:
1) Application layer TCP/IP protocols. Functions, duties, responsibilities and tasks of network manager.
2) Elements of the management process: hardware configuration, access control system, user account management, monitoring, optimization, time management, security violations, system documentation, contingency plan,
resource planning, personnel management, cooperation with service providers, system development.
3) Elements of computer network documentation.
4) Basic tools and protocols for network management (e.g. SNMP, DHCP, NTP, DNS, LLDP, netconf, syslog).

The lab classes consist of the following topics:
1) network client application implementation with socket inteface
2) network iterative server implementation with socket interface
3) concurrent servers implementation with socket interface
4) TCP buffering
5) datagram transmission implementation with socket interface
6) final project

Teaching methods

Lectures: multimedia presentation, presentation illustrated with examples presented on blackboard, elearing.
Labs: solving tasks, practical exercises with use of network devices, discussion, teamwork, multimedia showcase, configuration task verified during laboratory classes, final project implemented at home.

Bibliography

Basic
1. TCP/IP Protocol Suite, 4th edition, B.A. Forouzan, McGraw-Hill Education, New York, 2009
2. Data Communications and Networking, 5th ed., B.A. Forouzan, McGraw-Hill Education, New York 2012
3. Computer Networks, 5th edition, A.S. Tanenbaum, D.J. Wetherall, Pearson, Boston, 2011
4. Computer Networking: A Top-Down Approach, 7th edition, J.F. Kurose, K.W. Ross, Pearson Education, Boston, 2016
5. Computer Networks: A Systems Approach, L.L. Peterson, B.S. Davie, 5th edition, Morgan Kauffmann, San Francisco, 2012
6. Computer Networks, Comer, 2012

Breakdown of average student's workload

	Hours	ECTS
Total workload	125	5,00
Classes requiring direct contact with the teacher	42	2,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	83	3,00