SYLLABUS

Name: ***Administration of network systems (TIAu>SI6-AoNS-19)***
Name in Polish:
Name in English: ***Administration of network systems***

Information on course:

Course offered by department: Faculty of Automatic Control, Electronics and Computer Science
Course for department: Silesian University of Technology

Default type of course examination report:

ZAL

Language:

English

Course homepage:

https://platforma2.polsl.pl/rau2/course/view.php?id=215

Short description:

The aim of the course is presentation of methods for management of the operation and configuration of LAN network elements (switches, routers, gateways, firewalls), monitoring their operation and performance, and WAN performance monitoring and management.

Description:

Lecture:
Elements of local network infrastructure, principles and objectives of the LAN configuration, protocols RARP, BOOTP, DHCP.
Configuration of the local network topologies, protocols STP, RSTP, VLAN.
Configuration of the network layer, routing protocols (static, dynamic, internal, external routing). System administration tools of the command line (CLI), Web tools. Call relations management, network traffic filtering, restriction of access, communication tunneling, VPN.
Network bandwidth management, traffic shaping algorithms, quality of service (QoS). Monitoring network performance, management information base MIB II, protocol SNMP. Evaluation of the network performance - base profile, network congestion problem, development of the network.

Laboratory:
1. Configuration of LAN systems (DHCP server).
2. Network topology management (VLAN, STP).
3. Shaping network traffic (QoS).
4. Snmp network monitoring protocol.
5. Network routing configuration.
6. Monitoring the operation of the network.

Number of hours of classes with the direct participation of academic teachers
Number of ECTS credits: 3
Total Hours: 76 (45 contact hours / 31 student’s own work hours)
Lecture: 15h
Laboratory: 30h

Number of hours devoted to the student's own work
Preparation for laboratories, reports: 25h
Reading the literature: 6h

including
Number of ECTS points obtained during classes conducted with the direct participation of academic teachers: 1.5

Bibliography:

Tanenbaum A., Wetherall D., Computer networks , Pearson, 2011
Stallings W, SNMP, SNMPv2, and RMON: Practical Network Management, Addison-Wesley , 1996
Kurose J., Ross K., Computer Networking: A Top-Down Approach , Pearson, 2010
Douglas E. Comer, Computer Networks and Internets, Pearson, 2003
Haugdahl S., Network Analysis and Troubleshooting, Addison-Wesley, 1999

Learning outcomes:

Knowledge
Student knows and understands:
organization and principles of operation of LAN, WAN, VLAN, WLAN communication protocols and methods of configuring their hardware elements (K1A_W08)
operations of protocols of local area network topology configuration preventing loops occurrence and ensuring the reliability of local network connections (K1A_W12)
mechanisms for monitoring network performance and operation using MIB and RMON databases and methods for configuring them in network devices (K1A_W19)

Skills
Student is able to:
to design, configure and run network activity monitoring and visualization based on the SNMP protocol (K1A_U11)
design and configure simple local computer networks and monitor its operation (K1A_U21)
configure communication systems in a local area network while ensuring the required QoS levels (K1A_U29)

Assessment methods and assessment criteria:

Students have to do 6 laboratory exercises and prepare reports from the exercises within 2 weeks. Reports are assessed on a scale of 0 - 100 points, a positive assessment of the report from > 50 points. The final grade for the subject is the average of positive grades from the exercises.

The syllabus is valid from academic year 2024/25 and its content cannot be changed during the semester.

Course credits in various terms:

Information and Communications Technology, full-time first degree engineering studies 7 sem. (TIAu-SI7)			
Type of credits	Number	First term	Last term
European Credit Transfer System (ECTS)	3	2020/2021-L	