COURSE DESCRIPTION CARD - SYLLABUS

Course name
IP Networks [S1Teleinf1>SieciIP]

Course

Field of study
Teleinformatics

Year/Semester
2/3

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
30

Laboratory classes
30

Other
0

Tutorials
0

Projects/seminars
0

Number of credit points

4,00

Coordinators

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Lecturers

Prerequisites

Students starting this course should have basic knowledge of computer networks. They should be able to carry out basic configuration of network devices and be able to self-educate. They should also have awareness of the need to expand their competencies and willingness to cooperate as part of the team

Course objective

1. Provide students with knowledge in the field of routing protocols, traffic flow management, designing secure virtual private networks as well as MPLS and GMPLS techniques. 2. Acquainting students with engineering methods of designing and building local and wide-area networks. 3. Developing students' ability to configure network devices in the field of routing protocols, virtual private networks, and traffic flow management. 4. Acquainting students with the techniques of automation of network device configuration processes.

Course-related learning outcomes

Knowledge:
1. Students can use technologies enabling secure data transmission in wide area networks.
2. Students can solve typical design problems related to the selection of the optimal routing protocol.

3. Students can configure routers to work with a specific routing protocol, both intra-domain, and inter-domain.

Skills:
1. Students have a structured, mathematically founded, basic knowledge of the operation of routing algorithms and protocols.
2. Students have a basic knowledge of development trends in the field of local and wide area network technology. They have structured knowledge of the most important standards, architecture, operation and design of extensive ICT networks. They also have structured knowledge of the most important standards in modern intra-domain and inter-domain routing protocols.
3. Students have a basic knowledge of the operation and configuration of routing protocols in wide area and local computer networks.

Social competences:
1. Students know the limits of their own knowledge and skills, understand the necessity of further training.
2. Students are able to adjust to the rules of team work.
3. Students are aware of the responsibility for their own work.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Learning outcomes presented above are verified as follows:
The knowledge acquired during the lecture is verified during an oral and / or written test.
Test issues, based on which questions are developed, are sent to students by e-mail and / or posted on the ekursy.put.poznan.pl website.
Passing threshold: 50% of points.
The skills acquired during the laboratory classes are verified on an ongoing basis. At each laboratory class, the correctness of the network devices configuration is assessed on a scale from 2 to 5. The final grade is the average of the grades obtained from individual laboratory classes.

Programme content

A review of the most important protocols of the TCP / IPv4 / IPv6 stack
Managing the flow of packets in IP networks with the use of access control lists
Single-area and multi-area link-state protocols
Inter-domain protocols
Optimization of routing protocols
Fundamentals of secure traffic transmission in IP networks
Virtual private networks
GMPLS and T-MPLS networks
Introduction to the quality of service in IP networks
Introduction to automation of network device configuration processes

Course topics

A review of the most important protocols of the TCP / IPv4 / IPv6 stack
Managing the flow of packets in IP networks with the use of access control lists
Single-area and multi-area OSPF protocol
ISIS protocol
Basics of BGP
Optimization of routing protocols
Policy-based routing
Inter-AS traffic flow optimization
Fundamentals of secure traffic transmission in IP networks
Overlay virtual private networks
MPLS
Layer 3 peer-to-peer virtual private networks
GMPLS and T-MPLS networks
Layer two virtual private networks implemented using MPLS and Carrier Ethernet techniques.

Introduction to the quality of service in IP networks
Introduction to automation of network device configuration processes

Teaching methods

Lectures: multimedia presentations, illustrated with examples given on the blackboard.
Laboratory exercises: practical exercises in groups with the use of network devices.

Bibliography

Basic:
- Raymond Lacoste, Brad Edgeworth, CCNP Enterprise Advanced Routing ENARSI 300-410 Official Cert Guide, 2020, Hoboken, USA
- www.ietf.org

Additional:
metroethernetforum.org
Breakdown of average student's workload
Hours ECTS
Total workload 116 4.0
Classes requiring direct contact with the teacher 60 2.0
Student's own work (preparation for tests, preparation for laboratory 56 2.0
classes, literature studies)

Breakdown of average student's workload

	Hours	ECTS
Total workload	116	2,00
Classes requiring direct contact with the teacher	60	2,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	56	2,00