

Designing Computer Networks - course description

General information	
Course name	Designing Computer Networks
Course ID	11.3--INFP-PSKomput-Er
Faculty	Faculty of Computer Science, Electrical Engineering and Automatics .
Field of study	Computer Science
Education profile	academic
Level of studies	First-cycle Erasmus programme
Beginning semester	winter term 2021/2022

Course information	
Semester	6
ECTS credits to win	4
Course type	optional
Teaching language	english
Author of syllabus	<ul style="list-style-type: none">dr hab. inż. Marcin Mrugalski, prof. UZ

Classes forms					
The class form	Hours per semester (full-time)	Hours per week (full-time)	Hours per semester (part-time)	Hours per week (part-time)	Form of assignment
Laboratory	30	2	-	-	Credit with grade
Lecture	15	1	-	-	Credit with grade

Aim of the course

Developing the skills necessary to design enterprise computer networks; Introducing customer requirements, translating those requirements into equipment and protocol needs, and creating a network topology which addresses the needs of the customer; To provide basic knowledge about fundamentals of computer system structure and principles of operation.

Prerequisites

Computer networks

Scope

Introducing networking design concepts. The benefits of a hierarchical network design. Network design methodology. Functions of the core, distribution and access layers. Investigating servers farms and security of the computer networks. Investigating wireless network. Supporting WANs and remote workers. Gathering networks requirements. Introducing a lifecycle of computer networks. Preparing for the design process. Identifying technical requirements and constraints. Identifying manageability design considerations.

Characterizing the existing network. Documenting the existing network. Updating the existing internetworking operation system software. Upgrading the existing computer devices. Performing a wireless site survey. Documenting network design requirements. Identifying application impacts on network design. Characterizing network applications. Explaining common network applications. Introducing quality of service (QoS). Documenting application and traffic flows.

Creating a network project. Logical and physical topology design of the network. Designing logical addressing and names. WAN connection design. Selection of network devices. Configuration of network devices. Implementing routing protocols and STP algorithms. Configuration of mechanisms for ensuring security in networks. Preparation and presentation of the project offer.

Teaching methods

Lecture, project.

Learning outcomes and methods of their verification

Outcome description	Outcome symbols	Methods of verification	The class form
Can develop a construction and implementation schedule of a designed computer network.		<ul style="list-style-type: none">a test	<ul style="list-style-type: none">Lecture
Can estimate the time and resources necessary to implement the network.		<ul style="list-style-type: none">a project	
Can design convergence computer network according to client expectations.		<ul style="list-style-type: none">a project	
Is able to present a design offer		<ul style="list-style-type: none">a test	<ul style="list-style-type: none">Lecture
Can characterize hierarchical design model for local (LAN) and wide (WAN) computer networks		<ul style="list-style-type: none">a test	<ul style="list-style-type: none">Lecture
Is able to collect client requirements related to the properties of the designed computer network.		<ul style="list-style-type: none">a project	

Outcome description	Outcome symbols	Methods of verification	The class form
Can analyze and interpret technical requirements of the designed computer network and identify potential threats hindering the construction of the computer		<ul style="list-style-type: none"> a project 	
Can describe the role of core, distribution and access layers in the functioning of computer network.		<ul style="list-style-type: none"> a test 	<ul style="list-style-type: none"> Lecture

Assignment conditions

Lecture – the passing condition is to obtain a positive mark from the final test.

Laboratory – the passing condition is to obtain positive marks from a prepared project.

Recommended reading

1. McCabe J.D.: Network Analysis, Architecture and Design, 3rd ed. San Francisco. California: Morgan Kaufmann Publishers, Inc., 2007.
2. Oppenheimer P.: Top-Down Network Design, 3rd ed. Indianapolis, Indiana: Cisco Press, 2010.
3. Wilkins S.: CCDA Self-Study: Designing for Cisco Internetwork Solutions (DESGN), 2nd ed. 640-861, Indianapolis, Indiana: Cisco Press, 2007.

Further reading

Notes

Modified by dr hab. inż. Marcin Mrugalski, prof. UZ (last modification: 24-07-2021 09:25)

Generated automatically from SylabUZ computer system