Universidad Zaragoza

Academic Year/course: 2024/25

30377 - Network technologies

Syllabus Information

Academic year: 2024/25
Subject: 30377 - Network technologies
Faculty / School: 110 - Escuela de Ingeniería y Arquitectura
Degree: 581 - Bachelor's Degree in Telecommunications Technology and Services Engineering
ECTS: 6.0
Year: 3
Semester: 656 - First semester
581 - Second semester
Subject type: Compulsory
Module:

1. General information

The subject will allow the student to acquire an understanding of the functioning of telematic network technologies, as well as the ability to analyze them, which is absolutely essential for the exercise of the competences of a graduate in Telecommunication Technologies and Services Engineering.

In Addition to the knowledge acquired, the practical training received in the laboratory will be of great importance, regarding both the configuration of equipment and networks, and the ability to analyze from the captures and measurements made on the network. For these reasons, the skills acquired in this subject will be very useful for their training.

These approaches and objectives are aligned with some of the Sustainable Development Goals (SDGs) of the United Nations Agenda 2030 (https://www.un.org/sustainabledevelopment/es/). Specifically, the planned learning activities in this subject will contribute to the achievement of target 8.2 of Goal 8 and target 9.1 of Goal 9.

2. Learning results

The aim of the subject is that the student is able to know and correctly position the techniques and architectures of most common network technologies in access and transport. Know and be able to analyze the interconnection methods between these network technologies. To know the construction elements of data networks, their interconnection, how they are configured and the need to introduce management mechanisms to ensure proper monitoring and control of the main services and applications. Know how to configure a networking scenario with different technologies. Be able to analyze your their behavior by capturing data and analyzing it. And know the current technological trends of data networks and be able to compare the data transport mechanisms performed by each proposed technology.

3. Syllabus

Block 0. Introduction. Knowledge review.

Block 1. LAN Switched. Switched Ethernet. Structure of a switch. MAC routing. MAC switching. Multicast. Virtual LAN. Higher level switching. SDN (Software Defined Network).

Block 2. Wireless access technologies. Mechanisms of access to the environment. 802.11 WLAN networks.

Block 3. Switched WANs. FR: Frame Relay. ATM: Asynchronous Transfer Mode. MPLS: MultiProtocol Label Switching.

Block 4. Transportation technologies. Plesiochronous Digital Hierarchy (PDH). Synchronous Digital Hierarchy (SDH). Wavelength Division Multiplexation (WDM).

4. Academic activities

Type 1 activity (master classes) 20 hours. Following the course syllabus.

Type 2 activity (problem classes) 10 hours.

Type 3 activity (practical classes) 30 hours. Introduction to GNS3. Design and Management of LANC Technologies (Administer and manage LANC features such as switching tables or the creation of virtual LANs. Manage the computers, based on the SNMP protocol. Build a VLAN scenario over GNS3. Construction of a scenario of SDN for LANC in GNS3). Configuration of a

WIFI scenario. Design and management of switched WAN technologies.

Type 6 activity (teaching assignments) 08 hours. Development of an application for element concentration management of through SNMP.

Type 7 activity (self-study) 78 hours.

Final assessment activity Type 8 activity (written test) 04 hours.

5. Assessment system

The student will have a global test in each of the exams established throughout the term.

E1: Final exam (100%). Scoring from 0 to 10 points. It consists of two parts: E1A: Theoretical/practical content exam (50%). In this test, questions and/or problems related to the program taught in the subject will be posed.

Minimum score of 5 out of 10 points. E1B: Laboratory practices (50%). The realization of the practices in controlled laboratory scenarios is mandatory for all students. There is the possibility of continuous assessment of the practices.

Obtaining a minimum grade of 7 in this continuous assessment will exempt the student from taking a final practice test

. Minimum score of 5 out of 10 points. If a 5 is not exceeded in any of the above parts, the final grade will be failed. The grades of the final exam of the first call will not be kept for the second call.