Syllabus
2023 - 2024

GENERAL INFORMATION

Data of the subject	
Subject name	Computer Network Architecture
Subject code	DTC-GITT-321
Mainprogram	Bachelor's Degree in Engineering in Telecommunication Technologies
Involved programs	Grado en Ingeniería en Tecnologías de Telecomunicación [Third year]
Credits	7,5 ECTS
Type	Obligatoria (Grado)
Department	Department of Telematics and Computer Sciencies

Teacher Information	
Teacher	
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DESCRIPTION OF THE SUBJECT

Contextualization of the subject

Prerequisites

Communication Theory: elements of a communication system. Analog modulation.Frequency-division multiplexing. Digital modulation. Time-division multiplexing.

Course contents

Contents

Topic 1: BASIC CONCEPTS

Communications network concept. Transit and access networks. Data network. Transport networks. Converged networks. Network architecture. Link level description. Protocol models and industry standards. Elements of a network. Physical layer standards. Physical and logical topologies. Introduction to the interconnection of networks. Services.

Topic 2: THE LINK LAYER

Link level functions. Medium access techniques. Multiplexing. Frame delimitation. Addressing. Flow control. Detection and correction of transmission errors. Transmission efficiency. Connection and connectionless protocol.

Topic 3: INTRODUCTION TO LOCAL AREA NETWORKS

Concept. Topologies. Physical transmission methots. Bandwidth allocation techniques. Transmission performance.

Topic 4: ETHERNET/802.3 NETWORK

Ethernet features. Transmission modes. Topologies. Physical transmission methots. Media Access Protocol. Network elements. Physical level alternatives. Frame format. Physical configuration standards. FastEthernet. GigabitEthernet. Market and positioning of Ethernet.

Topic 5: LAN SWITCHING

Switched local area network concept: design. Switched LAN architecture. Switching. VLANs. Security. VTP. Spanning-tree protocol.

Topic 6: 802.11 WIRELESS LOCAL NETWORKS

Wireless network standards. Topologies. Physical level. CSMA/CA protocol. Wireless network planning.

Topic 7: INTRODUCTION TO WAN NETWORKS

WAN technology concepts. Overview of WAN technologies. Choice of WAN technology. WAN Services: DWDM, ISDN, FRAME RELAY, ATM, Ethernet WAN, Ethernet WAN, Ethernet WAN, MPLS, VSAT, xDLS, Cable Modem, 3G/4G/LTE.

Topic 8. WAN PROTOCOLS AND TECHNOLOGIES

PPP. HDLC. Frame Relay.

EVALUATION AND CRITERIA

Evaluation activities	Evaluation criteria	Weight
Exams: Inter-semester test (15%) Final Exam (50%)	• Understanding of concepts. • Application of concepts for problem solving. • Analysis and interpretation of the results obtained in the resolution of problems.	65
Continuous assessment: Tests and exercises (5%) Final Project (15%)	• Understanding of concepts • Application of concepts for problem solving • Analysis and interpretation of the results obtained in problem solving • Application of concepts to the design, configuration and administration of a network infrastructure that integrates various network technologies dealt with in the practices of the course • Integration and implementation of the knowledge, skills and abilities acquired in the subject	20

Evaluation of the experimental work: Final Laboratory Exam	• Understanding of concepts • Application of concepts to the design, configuration and administration of a network infrastructure that integrates various network technologies discussed in the course practices. • Integration and implementation of the knowledge, skills and abilities acquired in the subject.	15

BIBLIOGRAPHY AND RESOURCES