GENERAL INFORMATION

Data of the subject	
Subject name	Computer Network Technologies
Subject code	DTC-GITT-313
Mainprogram	Bachelor's Degree in Engineering in Telecommunication Technologies
Involved programs	Grado en Ingeniería en Tecnologías de Telecomunicación [Third year] Grado en Ingeniería en Tecnologías de Telecom. y Grado en Análisis de Negocios/Business Analytics [Third year]
Level	Reglada Grado Europeo
Quarter	Semestral
Credits	6,0 ECTS
Type	Obligatoria (Grado)
Department	Department of Telematics and Computer Sciencies
Coordinator	Alejandro García San Luis

Teacher Information	
Teacher	
Name	Alejandro García San Luis
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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

Grading

To pass the subject, students must obtain at least 5 out of 10 points on the final theory exam and the laboratory exam, both in the regular and extraordinary sessions. In the extraordinary session, they may keep the part of theory or laboratory that has been approved.

The grade in the regular session of the subject will be calculated as follows:

• 75% based on exam grades. The final theory exam will account for 50% of the final grade in the subject, and the laboratory exam will account for 25%.
• 15% corresponds to the grade of the mid-semester test.
• 10% corresponds to the grades obtained in intermediate progress tests.

The grade in the extraordinary session:

The same criteria as in the regular session will be applied, with the 25% obtained in the mid-semester test and the intermediate progress tests during the course being retained.

WORK PLAN AND SCHEDULE

Activities	Date of realization	Delivery date
Reading and studying the theoretical content in the course notes	After each class	
E-learning platform	After each class	
Exercises	After the class in which they are proposed	Next theory class day
Preparation for laboratory practices	Two days before each practice	
Partial submissions of the practice document	After each practice	The week after the practice is conducted
Preparation for Final Theory Exam	December	
Preparation for Laboratory Exam	December	

BIBLIOGRAPHY AND RESOURCES

Basic References

- Subject Notes: Slides on Moodle. 2024.
- Cisco e-learning platform: http://cisco.netacad.net
- Paul W Browning, Farai Tafa, Daniel Gheorghe, Dario Barinic. "Cisco CCNA in 60 Days", ISBN-13: 978-0992823986. Reality Press Ltd., 2020.