



COMILLAS

UNIVERSIDAD PONTIFICIA

ICAI

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CIHS

Syllabus
2024 - 2025

GENERAL INFORMATION

Data of the subject	
Subject name	Computer Network Architecture
Subject code	DTC-GITT-321
Main program	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	7,5 ECTS
Type	Obligatoria (Grado)
Department	Department of Telematics and Computer Sciences
Coordinator	Alejandro García San Luis

Teacher Information	
Teacher	
Name	Alejandro García San Luis
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Teacher	
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DESCRIPTION OF THE SUBJECT

Contextualization of the subject
Prerequisites
Course:: Network Technologies

Course contents

Contents



Topic 1: Basic Concepts

Network functions and services, protocols and protocol architecture, a simplified communications model, the OSI reference model, introduction to network interconnection.

Topic 2: Network Layer

Network layer functionality, addressing, routing protocols, modes of operation, network header addressing, route selection by class of service, congestion control, fragmentation and reassembly, network layer addresses and subnet addresses, network layer protocols, support for mobile stations.

Topic 3: TCP/IP Overview

Introduction to TCP/IP, TCP/IP structure, elements of IP networks, IP addressing, IP address classes, special IP addresses, IP addressing issues, addresses and names.

Topic 4: Routing Tables and Subnets

IP routing and routing tables, subnets, routing tables, management of public and private addresses.

Topic 5: IP and ICMP Protocols

Main functions of the IP layer, IP layer header, Internet Control Message Protocol (ICMP).

Topic 6: Address Resolution Protocols

ARP protocol, RARP protocol, InARP protocol.

Topic 7: TCP/IP Routing Protocols

Introduction, types of route calculation algorithms, Internet structure, Routing Information Protocol (RIP), OSPF routing protocol, BGP routing protocol.

Topic 8: Multicast Routing

Multicast message transmission, multicast addresses, host modifications for multicast support, IGMP protocol, multicast routers, multicast routing and the MBONE network.

Topic 9: IP Version 6

History and initial problems with IPv4, IPv6 development, IPv6 addresses and their representation, ICMPv6.

Topic 10: Transport Layer: UDP Protocol

UDP header format, datagram routing between layers, UDP process communication, IP address restrictions, UDP sockets.

Topic 11: Transport Layer: TCP Protocol

General TCP characteristics, TCP header format, TCP logic, congestion control, TCP connections.

Topic 12: Application Layer

TCP/IP applications: DNS, HTTP, and FTP.

Topic 13: Network Management

Introduction to network management, management elements, management protocols, remote monitoring, management tools.



EVALUATION AND CRITERIA

Evaluation activities	Evaluation criteria	Weight
Exams: Inter-semester test (15%) Final Exam (50%)	<ul style="list-style-type: none">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%)	<ul style="list-style-type: none">Understanding of conceptsApplication of concepts for problem solvingAnalysis and interpretation of the results obtained in problem solvingApplication of concepts to the design, configuration and administration of a network infrastructure that integrates various network technologies dealt with in the practices of the courseIntegration and implementation of the knowledge, skills and abilities acquired in the subject	20
Evaluation of the experimental work: Final Laboratory Exam	<ul style="list-style-type: none">Understanding of conceptsApplication 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 course, students must achieve at least 5 out of 10 points on both the final theory exam and the final laboratory exam, in both the regular and supplementary sessions. In the supplementary session, it is possible to retain the grade from the theory or laboratory part if it has been passed.

The grade for the course in the regular session will be calculated as follows:

Final Exam: 50%, Mid-term Exam: 15%, Final Laboratory Exam: 15%, Final Project: 15%, Intermediate Follow-up Tests: 5%

The grade for the course in the supplementary session:

The same criteria as in the regular session will be applied, retaining the 20% obtained from the intermediate tests during the course.

WORK PLAN AND SCHEDULE



Activities	Date of realization	Delivery date
Reading and studying the theoretical content in the course notes After each class	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
Submission of the final course practice	April	Last day of class
Preparation for Final Theory Exam	April/May	
reparation for Final Laboratory Exam	April/May	

BIBLIOGRAPHY AND RESOURCES

Basic References

Course Notes: Transparencies on Moodle. 2023.

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.

In compliance with current regulations on the **protection of personal data**, we would like to inform you that you may consult the aspects related to privacy and data [that you have accepted on your registration form](#) by entering this website and clicking on "download"

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