



COMILLAS

UNIVERSIDAD PONTIFICIA

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CIHS

Syllabus
2025 - 2026

GENERAL INFORMATION

Data of the subject	
Subject name	Computer Network Technologies
Subject code	DTC-GITT-313
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	6,0 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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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 methods. Bandwidth allocation techniques. Transmission performance.

Topic 4: ETHERNET/802.3 NETWORK

Ethernet features. Transmission modes. Topologies. Physical transmission methods. 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, xDSL, Cable Modem, 3G/4G/LTE.

Topic 8: WAN PROTOCOLS AND TECHNOLOGIES

PPP. HDLC. Frame Relay.

EVALUATION AND CRITERIA

The use of AI to produce full assignments or substantial parts thereof, without proper citation of the source or tool used, or without explicit permission in the assignment instructions, will be considered plagiarism and therefore subject to the University's General Regulations.

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:	<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,	



Tests and exercises (5%) Final Project (15%)	configuration and administration of a network infrastructure that integrates various network technologies dealt with in the practices of the course <ul style="list-style-type: none">• Integration 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 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.

Use of AI Tools

In the course *Network Technology*, the use of Artificial Intelligence (AI) tools—such as ChatGPT or similar platforms—is specifically regulated depending on the type of task being carried out. This regulation is intended to ensure that the assessment accurately reflects the competencies acquired by the student, while respecting the practical, technical, and conceptual nature of each activity.

The applicable conditions are detailed below:

Theoretical exams, problem-solving tasks, reports, and regular lab work

In all standard evaluation tasks (guided lab sessions, intermediate exercises, technical reports, written assignments, quizzes, or any other regular submission), the use of AI tools is **not permitted**.

The evaluation must be completed entirely without the assistance of AI in a controlled environment, ensuring that students rely solely on their own knowledge, understanding, and skills. AI must not be used at any point during the evaluation, and students must demonstrate their basic competencies and knowledge independently.



Final Laboratory Exam

In this specific case, the use of all types of documentation is permitted, both digital and printed, including access to the Internet and Artificial Intelligence tools. Students may use such tools to explore solutions, consult references, verify configurations, or validate procedures, always from an active and autonomous learning perspective.

AI may be used for preliminary activities such as brainstorming, outlining, and initial research. At this level, AI is employed for planning, synthesizing, and generating ideas; however, the evaluation must emphasize the student's ability to develop and refine these items independently. That is, AI may be used to plan, generate ideas, and consult commands.

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. 2025.
- 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"

<https://servicios.upcomillas.es/sedelectronica/inicio.aspx?csv=02E4557CAA66F4A81663AD10CED66792>