SUBJECT TEACHING GUIDE

1519 - Computer Networks

EUNICE Joint Master Degree: Information Technology for Smart and Sustainable Mobility

Academic year 2026 - 2027

1. IDENTIFYING DATA					
Degree	EUNICE Joint Master Degree: Information Technology for Smart and Sustainable Mobility			Type and Year	Compulsory. Year 1
Faculty	School of Industrial Engineering and Telecommunications				
Discipline					
Course unit title and code	1519 - Computer Networks				
Number of ECTS credits allocated	4	Term		Semester based (1)	
Knowledge Field	Electrical engineering, electronic engineering and telecommunications engineering				
Web					
Language of instruction	English	English Friendly	No	Mode of delivery	Face-to-face

Department	DPTO. INGENIERIA DE COMUNICACIONES
Name of lecturer	LUIS FRANCISCO DIEZ FERNANDEZ
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Office	Edificio Ing. de Telecomunicación Prof. José Luis García García. Planta: - 2. DESPACHO (S277)
Other lecturers	ALBERTO ELOY GARCIA GUTIERREZ

4. OBJECTIVES
Develop knowledge of systems of communication networks.
Understand the Internet network model and the main protocols involved.
Develop knowledge of wireless technologies and understand their capabilities for the provision of communication services.

6. SUBJECT PROGRAM	
CONTENTS	
1	Module 1: Communication Architecture. Wired and wireless transmission media. OSI layered model. Network topologies and devices.

2	Module 2: Data Transmission. Communication modes (simplex, half-duplex, duplex). Frame format, error control (ARQ, Go-Back-N, selective repeat). Flow control (stop-and-wait, sliding windows).
3	Module 3: Medium Access Techniques. Random access protocols (ALOHA, slotted ALOHA, CSMA, CSMA/CD, CSMA/CA). Multiple access techniques (TDMA, FDMA, OFDMA).
4	Module 4: Internet protocols. Local Area Networks (Ethernet). TCP/IP model. IP protocol and family of Internet protocols. Transport protocols.
5	Module 5: Wireless networks. Wireless personal and local area technologies (Bluetooth, IEEE 802.11-WiFi). Wireless technologies for sensor networks (IEEE 802.15). Fundamentals of cellular technologies.
6	Module 6: Routing and mobility. Types of routing algorithms: distance vector and link state. Protocols in IP networks for routing and mobility.

7. ASSESSMENT METHODS AND CRITERIA

Description	Type	Final Eval.	Reassessment	%
Midterm exam 1	Written exam	No	Yes	30,00
Midterm exam 1	Written exam	No	Yes	40,00
Lab assignments	Work	No	No	30,00
TOTAL				100,00

Observations

The final course grade (FINAL GRADE) is based on the theory (TEOR) and practical (PRAC) components.
The theory grade is calculated from two midterm exams (graded out of 10), taken at the end of Module 3 (MIDTERM 1) and Module 6 (MIDTERM 2), as follows:
TEOR = 0.3 × MIDTERM 1 + 0.4 × MIDTERM 2

The practical component is assessed through mandatory reports submitted after the corresponding lab sessions. Each report is graded out of 10.
The final course grade is computed as:
FINAL GRADE = TEOR + 0.3 × PRAC

A minimum grade of 5/10 is required in each midterm exam (MIDTERM 1 and MIDTERM 2). If this requirement is not met, the corresponding component may be retaken during the official regular or resit examination periods on the dates established by the University.

Observations for part-time students

Students who do not participate in continuous assessment or do not attend classes will be evaluated solely on the basis of the final examination.

8. BIBLIOGRAPHY AND TEACHING MATERIALS

BASIC

Andrew S. Tanenbaum and David J. Wetherall. 2010. Computer Networks (5th. ed.). Prentice Hall Press, USA.

James F. Kurose and Keith W. Ross. 2012. Computer Networking: A Top-Down Approach (6th Edition) (6th. ed.). Pearson.