

## SUBJECT TEACHING GUIDE

### 1089 - Networks and Telematics Services

### Master's Degree in Telecommunication Engineering

Academic year 2025-2026

1. IDENTIFYING DATA					
Degree	Master's Degree in Telecommunication Engineering			Type and Year	Optional. Year 1
Faculty	School of Industrial Engineering and Telecommunications				
Discipline	Optional Subjects				
Course unit title and code	1089 - Networks and Telematics Services				
Number of ECTS credits allocated	4	Term	Semester based (1)		
Web	<a href="http://www.timat.unican.es">http://www.timat.unican.es</a>				
Language of instruction	Spanish	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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Other lecturers	JOSE ANGEL IRASTORZA TEJA

### 3.1 LEARNING OUTCOMES

- Understand the Internet's protocols architecture. The student will have the capacity to decide, design and develop a communication network/service based on specific use cases. The student will recognize and understand the most important, present and future, protocols architectures. The student will be able to identify and describe a communication network as well as the services included therein. The student will be able to apply the basic concepts for Networks and Systems management

**4. OBJECTIVES**

To enlarge the understanding of current communication networks ' systems by thoroughly describing the Internet's architecture and its relation with the OSI model. To study in detail the Internet's layered model, mainly the protocols used at Network level (IP) and those used at Transport level (TCP and UDP). To analyse the evolution of the interconnection protocols at the Internet and to study the solutions adopted for the provision of services in mobile scenarios. To learn the basic concepts for the Networks and Systems management by studying the main architectures and protocols used for the Internet networks management.

**6. SUBJECT PROGRAM**

**CONTENTS**

1	Theme I: TCP/IP ARCHITECTURE. The Internet model. Network access layer. IP addressing. Internet Protocol (IP). IP accessory protocols
2	Theme II: TRANSPORT LAYER PROTOCOLS. The transport layer. UDP protocol. TCP protocol. The socket interface
3	Theme III: BASIC SERVICES AND APPLICATIONS. Telnet. FTP (File Transfer Protocol). DNS. The Web (HTTP). E-mail (SMTP, POP, IMAP)
4	Theme IV: NETWORK MANAGEMENT. The OSI standards for system management. Internet management architecture. Internet information model. SNMPv2 and v3. Internet MIBs

**7. ASSESSMENT METHODS AND CRITERIA**

Description	Type	Final Eval.	Reassessn	%
Tests with short exercises will be carried out at the end of the blocks. These activities can be compensated in the final exam.	Others	No	Yes	50,00
It will embrace both practical exercises and theoretical questions.	Written exam	Yes	Yes	50,00
<b>TOTAL</b>				<b>100,00</b>
<b>Observations</b>				
Practice sessions are mandatory. Final mark is obtained by applying the following formula, in which TEOR is the mark from theory sessions and PRAC is the mark from the practice sessions: $MARK = TEOR * 0.8 + PRAC * 0.2$ The mark from the theory sessions (i.e. TEOR) comes from the marks obtained from the Continuous Evaluation (EC) tests and the one from the Final Exam (EF). In any case, it will be necessary to get a mark above 4.0 in the Final Exam to pass. Moreover, the mark from the EC will not harm the final mark so $TEOR = \max\{0.7 * EF + 0.3 * EC; EF\}$				
<b>Observations for part-time students</b>				
Continuous Evaluation is not mandatory. Those students that do not take it will have their final mark from the marks of the Practice sessions and from the Final Exam.				

**8. BIBLIOGRAPHY AND TEACHING MATERIALS**

**BASIC**

Charles M. Kozierok: The TCP/IP guide: a comprehensive, illustrated Internet protocols reference, No Starch Press, 2005

W. Richard Stevens: TCP/IP Illustrated: The protocols, Addison-Wesley Professional, 1994

Silvia Hagen: IPv6 Essentials, O'Reilly Media, Inc., 2<sup>o</sup> ed. 2006

Stallings, William : SNMP, SNMPv2, SNMPv3, and RMON 1 and 2, Addison-Wesley Professional, 3 edition (January 1, 1999)

Kurose, Ross: Redes de Computadores, Pearson, Addison Wesley, 2003

W. Stallings, Redes e Internet de Alta Velocidad Prentice Hall 2<sup>o</sup> ed. 2004

