SUBJECT TEACHING GUIDE

G817 - Communication of Data

Degree in Telecommunication Technologies Engineering

Academic year 2019-2020

1. IDENTIFYING DATA					
Degree	Degree in Telecommunication Technologies Engineering			Type and Year	Compulsory. Year 2
Faculty	School of Industrial Engineering and Telecommunications				
Discipline	Subject Area: Networks and Data Communication Module in Common with the Telecommunications Branch				
Course unit title and code	G817 - Communication of Data				
Number of ECTS credits allocated	6	Term		Semester based (1)	
Web	https://www.tlmat.unican.es				
Language of instruction	Spanish	English Friendly	Yes	Mode of delivery	Face-to-face

Department	DPTO. INGENIERIA DE COMUNICACIONES
Name of lecturer	ROBERTO SANZ GIL
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Other lecturers	MARTA GARCIA ARRANZ

3.1 LEARNING OUTCOMES

- Knowledge of the basic concepts on open network architectures, protocols, entities and communication interfaces.
  Knowledge of basic techniques on data link layer and network layer.

4. OBJECTIVES

The main aim is to introduce data communication networks to students, as well as protocol architectures. Also, basic concepts about data circuit and data links will be shown, applying a special point on the technics and protocols which are used to achieve a free error transmission between two or more devices. Finally, Local Area Network (LAN) and Wide Area Network (WAN) operation modes and their interconnection will be explained, as well as introducing the Internet protocol architecture based on the TCP/IP stack.

6. COURSE ORGANIZATION

CONTENTS	
1	Chapter 1. Data transmission fundamentals.Communication modes: simplex, semi-duplex, duplex. Bit, character and frame synchronization. Synchronous and asynchronous transmission modes. Flow and error control concepts. Information sources. Source coding. Source compression. Entropy. Compression algorithms. Huffman codes. Facsimile. Cyclic Redundancy Check (CRC). Physical layer interface norms.
2	Chapter 2. Course introduction. Communication architecture concept. Protocol functions. Proprietary communication architectures. Standardization organizations. The OSI reference model. Service primitives. Application oriented layers. Network dependent layers. Internet vs OSI. Error control. Data compression. Universal Communication Interfaces.
3	Chapter 3. Data link definition. Link layer functions. Flow control mechanisms without errors. Stop & Wait Protocol. Sliding window protocols. Error control. Continuous ARQ Protocols. Go-Back N Protocols. Selective rejection protocols.
4	Chapter 4. Data link control protocols. Character-oriented and bit-oriented protocols. File transfer protocolos: X-modem and Kermit. The BSC of IBM protocol. ISO HDLC protocol. Operation modes: NRM and ABM. HDLC subclasses.
5	Chapter 5. Local Area Networks. Topologies and transmission media. Medium access control techniques. Aloha and Slotted Aloha protocols. CSMA, CSMA/CD and CSMA/CA protocols. IEEE 802.x standards. Ethernet and WLANs networks. Ethernet switching.
6	Chapter 6. The need for interconnecting heterogeneous networks. The Internet. The router concept. Particularization for the IP Protocol. ARP and ICMP Protocols. TCP and UDP Protocols. Application protocols. Practical applications of TCP/IP.
7	Chapter 7. The need for Wide Area Networks. Circuit switching revision. Packet switching revision: datagram and virtual circuit techniques. X.25 recommendation as a packet switched network: physical, link and network levels. The Packet Assembler and Dissembler (PAD).
8	Written exam: multiple choice test questions and exercices.

7. ASSESSMENT METHODS AND CRITERIA

Description	Type	Final Eval.	Reassessn	%
Ordinary final exam.	Written exam	Yes	Yes	40,00
Two or more individual evaluations per term.	Written exam	No	Yes	35,00
Laboratory assignment evaluation.	Laboratory evaluation	Yes	No	25,00
TOTAL				100,00

Observations

The final qualification mark is obtained by means of the following expression, in which TEOR is the one corresponding to the theory part of the course and PRAC corresponds to laboratory assigments.
FINAL = TEOR*0.75 + PRAC*0.25
The theory qualification is obtained from the individual exams (Continous Evaluation) and the final ordinary exam (EF). The EC value will never jeopardize the final qualification.

Observations for part-time students

The final qualification mark is obtained by means of the following expression, in which TEOR is the one corresponding to the theory part of the course and PRAC corresponds to laboratory assigments.
FINAL = TEOR*0.75 + PRAC*0.25
The theory qualification is obtained from the individual exams (Continous Evaluation) and the final ordinary exam (EF). The EC value will never jeopardize the final qualification.

8. BIBLIOGRAPHY AND TEACHING MATERIALS

BASIC

F. Halsall, "Data Communications, Computer Networks and Opens Systems" (4ª edición), Addison Wesley, 1996
F. Halsall, "Computer Networking and the Internet", (5ª edición), Addison Wesley, 2005