SUBJECT TEACHING GUIDE

M1610 - Design and operation of telematic networks

Master's Degree in Telecommunication Engineering

Academic year 2018-2019

1. IDENTIFYING DATA					
Degree	Master's Degree in Telecommunication Engineering			Type and Year	Compulsory. Year 1
Faculty	School of Industrial Engineering and Telecommunications				
Discipline					
Course unit title and code	M1610 - Design and operation of telematic networks				
Number of ECTS credits allocated	5	Term		Semester based (1)	
Web	http://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	RAMON AGÜERO CALVO
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Other lecturers	LUIS FRANCISCO DIEZ FERNANDEZ

3.1 LEARNING OUTCOMES
- Understand the performance assessment of channel access techniques.
- Understand multiple access schemes and solutions, their application for mobile communications, and their performance evaluation
- Carry out the analysis of various techniques, algorithms and protocols for both the network and transport layers
- Use software tools to carry out the analysis of the aforementioned techniques

4. OBJECTIVES

The main goal of this course is adquiring the capacity of analyze, on a critical and objective way, the performance and behaviour of various techniques, algorithms and protocols for communication systems.

In particular, special attention will be paid to channel access methods (local area networks) and multiple access techniques (mobile communication networks)

Different solutions at both network (routing) and transport levels will be studied as well.

6. COURSE ORGANIZATION

CONTENTS	
1	Part 1 - Analysis of channel access techniques. Aloha Protocols. CSMA Protocols. CSMA/CD and CSMA/CA.
2	Part 2 - Analysis of multiple Access techniques. Introduction. Legacy solutions: FDMA and TDMA. CDMA multiple access. LTE (OFDMA)
3	Part 3 - Network layer algorithms and protocols. Routing and buffer management. Software Defined Networking (SDN) and OpenFlow. Information Centric Networking
4	Part 4 - Analysis of transport layer techniques and protocols: TCP. Congestion control. Legacy TCP. Evolution of TCP congestion control. TCP performance assessment

7. ASSESSMENT METHODS AND CRITERIA

Description	Type	Final Eval.	Reassessn	%
Parts 1 and 2 Exam	Written exam	No	Yes	35,00
Parts 3 and 4 Exam	Written exam	No	Yes	35,00
Lab assignments	Work	No	No	30,00
TOTAL				100,00

Observations

The final course qualification is based on two parts: theory (TEOR) and lab assigments (PRAC).
- The theory part is the average of the two exams (one for Parts 1 and 2 and another one for Parts 3 and 4)
- Lab assignments are marked based on the deliverables that the students would need to prepare (groups of 3/4 people).
This is compulsary and a requirement to pass the course.

The final qualification (EF) will be EF = 0.7*TEOR + 0.3*PRA
In any case, the qualification for each of the two theory parts must be higher tan 4; otherwise the final course qualification would be the one corresponding to it. The lab qualification is kept until the September extraordinary exam.

Observations for part-time students

The two intermediate exams are optional; if a student did not want to take them, the qualification corresponding to the theory would be that of the final ordinary exam.

8. BIBLIOGRAPHY AND TEACHING MATERIALS

BASIC

A. Tanenbaum, D. Wetherall, "Computer Networks". Fifth Edition. Pearson

T. Rappaport. "Wireless Communications: Principles and Practice". Second Edition. Prentice Hall