



## IDENTIFYING DATA

### (\*)Comunicacións Multimedia

Subject	(*)Comunicacións Multimedia			
Code	V05M145V01213			
Study programme	(*)Máster Universitario en Enxeñaría de Telecomunicación			
Descriptors	ECTS Credits	Choose	Year	Quadmester
	5	Mandatory	1st	2nd
Teaching language	English			
Department				
Coordinator	Comesaña Alfaro, Pedro			
Lecturers	Comesaña Alfaro, Pedro			
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Web				
General description				

## Competencies

Code	
A6	CG1 The ability to project, calculate and design products, processes and facilities in telecommunication engineering areas.
A9	CG4 The capacity for mathematical modeling, calculation and simulation in technological centers and engineering companies, particularly in research, development and innovation tasks in all areas related to Telecommunication Engineering and associated multidisciplinary fields.
A19	CE1 The ability to apply methods of information theory, adaptive modulation and channel coding, as well as advanced techniques of digital signal processing systems and audiovisual communications.
A22	CE4 The ability to design and plan networks for transporting, broadcasting and distribution of multimedia signals.
A24	CE6 The ability to model, design, implement, manage, operate, and maintain networks, services and contents.
A26	CE8 The ability to understand and know how to apply the operation and organization of the Internet, new generation Internet technologies and protocols, component models, middleware and services.

## Learning aims

Expected results from this subject	Typology	Training and Learning Results
The ability to project, calculate and design products, processes and facilities in telecommunication engineering areas.	Know How	A6
The capacity for mathematical modeling, calculation and simulation in technological centers and engineering companies, particularly in research, development and innovation tasks in all areas related to Telecommunication Engineering and associated multidisciplinary fields.	Know How	A9
The ability to apply methods of information theory, adaptive modulation and channel coding, as well as advanced techniques of digital signal processing systems and audiovisual communications.	Know How	A19
The ability to design and plan networks for transporting, broadcasting and distribution of multimedia signals.	know	A22
The ability to model, design, implement, manage, operate, and maintain networks, services and contents.	Know How	A24
The ability to understand and know how to apply the operation and organization of the Internet, new generation Internet technologies and protocols, component models, middleware and services.	know	A26

Understanding the fundamental characteristics of a lattice, and the properties we must take into account when facing a source coding problem and a channel coding problem.	Know How	A6 A9 A19
Understand that a trellis code defines a lattice and why this construction is useful for source coding (Trellis-Code Quantization)	know Know How	A6 A9 A19
Understanding of the different distributed source coding schemes.	know Know How	A6 A9 A19 A22
Implementation of a distributed source coding scheme.	Know How	A9 A19 A22 A24 A26
Understanding of the different schemes of joint source and channel coding.	know Know How	A6 A9 A19
Implementation of a joint and source channel coding scheme.	Know How	A6 A9 A19 A22 A24 A26
Understanding of the characteristics of different ways of multimedia signal distribution, paying special attention to streaming schemes.	know Know How	A6 A22 A24 A26
Assessment of the modularity of new video coding standards (e.g., MPEG-7)	know	A6 A22 A24 A26

## Contents

Topic	
1) Lattices	1) Definition 2) Basic properties
2) Advanced source coding	1) Trellis Code Quantization
3) Distributed source coding	1) Lossless coding 2) Lossy coding
4) Joint source-channel coding	1) Shannon's separability principle 2) JSCC practical examples
5) Multimedia content distribution	1) DVB 2) DVD 3) IPTV
6) Additional services	1) Services supported by modern video coding standards

## Planning

	Class hours	Hours outside the classroom	Total hours
Laboratory practises	13	44	57
Master Session	15	30	45
Reports / memories of practice	0	21	21
Long answer tests and development	2	0	2

\*The information in the planning table is for guidance only and does not take into account the heterogeneity of the students.

## Methodologies

	Description
Laboratory practises	15 hours of PC lab. Programming of computational simulations. The student will simulate, by using a numerical calculus programming language (as Matlab) the multimedia communications systems introduced in this subject.  Competencies: A6, A9, A19, A22, A24, A26.

Master Session 15 hours of theoretical lessons, where practical cases will be introduced. Furthermore, autonomous homework exercises will be proposed.

Competencies: A6, A9, A19, A22, A24, A26.

### Personalized attention

Tests	Description
Reports / memories of practice	The personalized attention will be mainly focused on both the practical part of the subject, and the consulting hours; they will be mainly related to the realization of practical homeworks.

### Assessment

	Description	Qualification
Laboratory practises	Numerical simulation programming.	20
	Competencies: A6, A9, A19, A22, A24, A26.	
Reports / memories of practice	Report on lab practises.	10
	Competencies: A6, A9, A19, A22, A24, A26.	
Long answer tests and development	Final exam.	70
	Competencies: A6, A9, A19, A22, A24, A26.	

### Other comments on the Evaluation

In order to do the weighted average of the different qualifications, the student should submit all the mentioned tasks. Furthermore, a minimum mark of 40% should be achieved in the final exam.

The same rules are applied to the second call.

Plagiarism/copy in any of the tasks described above implies automatic failure.

### Sources of information

Tatipamula e Khasnabish, **Multimedia communications networks: technologies and services**, Artech House, Scientific papers pointed out by the instructor,

### Recommendations

#### Subjects that it is recommended to have taken before

(\*)Tratamento de Sinal en Comunicaci3ns/V05M145V01102

(\*)Procesado de Sinal en Sistemas Audiovisuais/V05M145V01212

#### Other comments

Even if this subject has not a series of mandatory prerequisites, it is highly recommended that the student has a minimal background on:

Statistics.

Signal Processing.

Channel coding.

Source coding.

Internet networks and services.