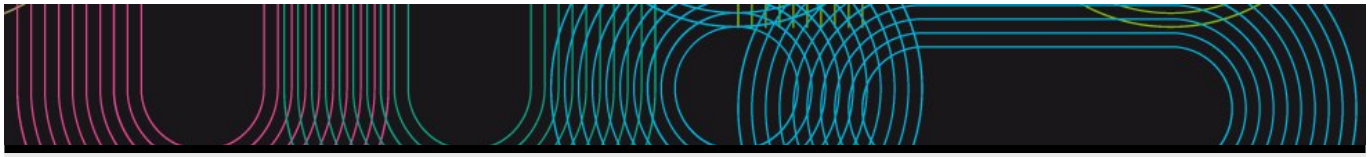

IDENTIFYING DATA				
(*)Procesado de Sinal en Sistemas Audiovisuais				
Subject	(*)Procesado de Sinal en Sistemas Audiovisuais			
Code	V05M145V01212			
Study programme	(*)Máster Universitario en Enxeñaría de Telecomunicación			
Descriptors	ECTS Credits	Choose	Year	Quadmester
	5	Mandatory	1st	2nd
Teaching language	English			
Department				
Coordinator	Alba Castro, José Luis			
Lecturers	Alba Castro, José Luis Martín Rodríguez, Fernando			
E-mail	jalba@gts.uvigo.es			
Web	http://faitic.uvigo.es			
General description	In this subject the student will learn the main compression and coding techniques for audiovisual systems in the MPEG4 standard and the audiovisual information structure in it. They will also learn the main features of the MPEG7 standard for multimedia informaction description and retrieval.			

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.

Learning aims		
Expected results from this subject	Typology	Training and Learning Results
CG1 Capacity to project, calculate and design products, processes and installations in all the fields of the telecommunication engineering.	know Know How	A6
CG4 Capacity for mathematical modelling, calculation and simulation in technological centres and engineering companies, particularly in tasks of research, development and innovation in all the fields related with Telecommunication Engineering and affine multidisciplinary fields.	know Know How	A9
CE1 Capacity to apply information theory, adaptative modulation and channel coding methods, as well as advanced techniques of digital signal processing, to the communication and audiovisual systems.	Know How	A19
Knowing how to leverage perceptual effects and spatio-temporal redundancy to compress audiovisual information.	know Know How	A19
Understanding of the MPEG4 structure and its necessity	know	A19
Understanding the audio and video processes that guarantee perceptual quality, and knowing the main algorithms of the standards.	know	A19
Knowing how to process audiovisual signals to extract metadata for searching and retrieval of information.	know Know How	A19
Knowing the structure and usefulness of the MPEG7 standard	know	A19

Contents

Topic	
Introduction to the audiovisual compression and coding.	Human perception, redundancy and irelevance. History of the standards of compression. Analysis and description of the space-time structure in video.
Video coding.	Standards of video compression in MPEG 1, 2 and 4; H.261, H.263, H.264 (AVC)
Audio coding.	Standards of audio compression in MPEG 1, 4 (Mp3, AAC).
Advanced Audiovisual description.	MPEG7. Advanced audiovisual Description. Organisation of the multimedia content. Information retrieval.

Planning

	Class hours	Hours outside the classroom	Total hours
Practice in computer rooms	10	30	40
Tutored works	10	50	60
Master Session	8	8	16
Multiple choice tests	1	0	1
Reports / memories of practice	1	7	8

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

Methodologies

	Description
Practice in computer rooms	The students work in specific concepts explained in the lecture sessions by using computer applications. The students partially acquire competences A6, A9 and A19.
Tutored works	The students work in the explained concepts and their extensions. Each problem/work lasts several weeks in which the student, in groups of 2, discovers, by himself, or with the help of the professor, what is needed to solve it. The work, or a part of it, will have to be exposed in public. The students partially acquire competences A6, A9 and A19.
Master Session	In each class of 2 hours there will be 30 minutes dedicated to the lecturing of the contents of the subject, boosting the critical discussion of the concepts and assimilating them a posteriori by means of the use of computer programs. The students partially acquire competences A6, A9 and A19.

Personalized attention

Methodologies	Description
Master Session	Personalized attention will be carried out during the 3-hour sessions in the lab, guiding and advising each student to make the most of his time for solving the practical problem at hand. Plus, the student can make use of the counseling hours whenever he needs them.
Practice in computer rooms	Personalized attention will be carried out during the 3-hour sessions in the lab, guiding and advising each student to make the most of his time for solving the practical problem at hand. Plus, the student can make use of the counseling hours whenever he needs them.
Tutored works	Personalized attention will be carried out during the 3-hour sessions in the lab, guiding and advising each student to make the most of his time for solving the practical problem at hand. Plus, the student can make use of the counseling hours whenever he needs them.

Assessment

	Description	Qualification
Multiple choice tests	These tests are linked to the concepts expained in the lectures and the student work in each guided task. Competences related to A19 are assessed in these tests.	20
Reports / memories of practice	The score of the guided task includes: the selection and organisation of the documentation, the follow-up of each student, the techniques used, the results achieved and the presentation of them. Competences A6, A9 and A19 are assessed with these reports.	80

Other comments on the Evaluation

Attendance is compulsory in continuous assessment, unless special circumstances are alleged. Continuous assessment will be based on the student lab work and guided tasks related to contents of the subject. There will be an official final exam scheduled by the "Junta de Escuela" that the students that didn't pass the continuous assessment will have to take if they want to pass the course. This final exam will be scored from 0 to 10 points and includes all the topics explained during the course and also concepts and techniques explained for the guided tasks. To pass this exam the student has to score, at least, 5 points. The students that are eager to improve their continuous assessment score can also take the final exam. In

this case the final score of the course will be the maximum score of the final exam and continuous assessment. Throughout the semester the students will be receiving feedback about his performance on the continuous assessment, along with the scores obtained in the tests and guided tasks. Delivering any of the guided tasks or sitting any test will automatically mean that the student is following the course in the continuous assessment mode. That means that he will appear as "presented" in the records of the subject even if the final exam is not taken.

The July final exam will only be held for students who failed the course both in continuous assesment mode or final exam. The score of the subject will be the score of this exam. The exam will be scored between 0 and 10. To pass the subject, at least 5 points are needed.

Sources of information

Fernando Pereira and Touradj Ebrahimi, **The MPEG-4 book**, IMSC Press Multimedia Series,

Thiagarajan, Jayaraman, **Analysis of the MPEG-1 Layer III (MP3) Algorithm using MATLAB**, Morgan & Claypool,

Richardson, Iain E. G., **H.264 and MPEG-4 video compression : video coding for next generation multimedia**, Wiley, cop.,

Recommendations

Subjects that are recommended to be taken simultaneously

(*)Comunicacións Multimedia/V05M145V04213

Subjects that it is recommended to have taken before

(*)Tratamento de Sinal en Comunicacións/V05M145V04102