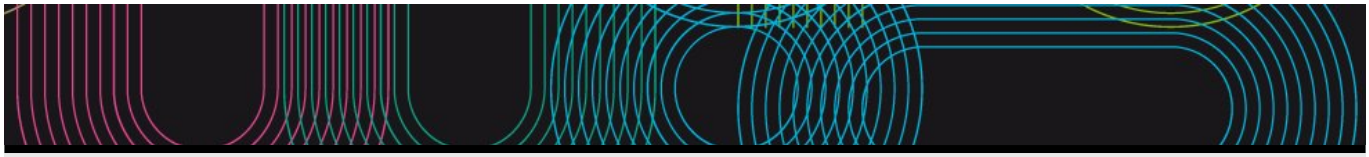

IDENTIFYING DATA				
(*)Fundamentos de son e imaxe				
Subject	(*)Fundamentos de son e imaxe			
Code	V05G300V01405			
Study programme	(*)Grao en Enxeñaría de Tecnoloxías de Telecomunicación			
Descriptors	ECTS Credits	Choose	Year	Quadmester
	6	Mandatory	2nd	2nd
Teaching language	Spanish			
Department				
Coordinator	Abreu Sernández, María Victoria			
Lecturers	Abreu Sernández, María Victoria Docio Fernández, Laura Martín Rodríguez, Fernando Pena Giménez, Antonio			
E-mail	vabreu@uvigo.es			
Web	http://faitic.uvigo.es			
General description	"Fundamentos de Sonido e Imagen" presents the basic concepts of sound and image, as well as the processes operating over the audiovisual signals.			

Competencies	
Code	
A3	CG3: The knowledge of basic subjects and technologies that capacitates the student to learn new methods and technologies, as well as to give him great versatility to confront and update to new situations
A5	CG5: The knowledge to perform measurements, calculations, assessments, appraisals, technical evaluations, studies, reports, task scheduling and similar work to each specific telecommunication area.
A22	CE13/T8: The ability to understand the electromagnetic and acoustic wave mechanisms of propagation and transmission, and their corresponding receiving and transmitting devices.

Learning aims	
Expected results from this subject	Training and Learning Results
Analysing the basic properties of the sound.	A3 A22
Explaining different sound production systems: human sound production, musical instruments, machines and other vibrant systems.	A22
Interpreting results of acoustic measures and selecting tools for the appropriate analysis.	A5
Describing the human perception of sound based on the physiological interface and the psychology of the perception.	A3 A22
Reviewing diffrent processes and systems associated to the sound production	A3 A5
Applying the basic rules of the colorimetry.	A3
Analysing lens systems.	A3
Choosing the most suitable capture and presentation image sytems.	A3 A5
Choosing the most adapted formats for image and video.	A3 A5
Relating the influence of the coding parameters with the results of compression and quality.	A3 A5

Contents

Topic	
S1. Acoustic waves	Introduction. Acoustic wave equation. Harmonic plane waves. Spherical waves. Power and Intensity. Diffraction
S2. Sound propagation and transmission	Acoustic field. Propagation.Transmission between different media.
S3. Sound radiation and production	Impedances. Transductors. Mechanical vibration. Radiation of simple sources. Directivity.
S4. Sound perception	Human audition. Auditory losses. Equal loudness contours.
I1. Colorimetry	Fiixed image signals and video signals. Visual human system. Light and colour. Visual effects.
I2. Capture and representation of images	Cameras and lens. Monitors. 3D Visualisation.
I3. Image and video coding	Fixed image: format of colour YUV; standards of compression. Image in movement: H.261 standard; MPEG formats.
Projects S1 and S2. Sound analysis.	Time, frequency and spectrograms.
Projects S3 and S4. Sound measurements	Sound pressure level. Sonometer. Octave-filter banks
Project I1. Colorimetry	Basic functions
Project I2. Fixed images coding	Functions for JPEG coding
Project I 3. Video coding	Time-predictive coding

Planning

	Class hours	Hours outside the classroom	Total hours
Introductory activities	1	0	1
Master Session	26	50	76
Troubleshooting and / or exercises	6	12	18
Practice in computer rooms	17	20	37
Forum Index	0	1	1
Multiple choice tests	0	2	2
Practical tests, real task execution and / or simulated.	1	0	1
Long answer tests and development	4	0	4
Short answer tests	1	0	1
Reports / memories of practice	0	9	9

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

Methodologies

	Description
Introductory activities	Course presentation: programme, reading materials, teaching methodology and assessment system
Master Session	Instructor presentation of the main concepts of each subject. Classes do not cover all content that is examination material. The student should take the contents of the documents provided for each subject. Student will work alone afterwards on the concepts studied in class and on expanding this content using the documents provided for each subject. Identification of doubts that need to be resolved in personalized tutorials.
Troubleshooting and / or exercises	Problems and exercises formulated according to the content of the lectures and the documents for each subject. Students solve problems and exercises prior to the class. Identification of doubts that need to be resolved in personalized tutorials.
Practice in computer rooms	Handling of analysis tools and algorithms. Identifying which one must to be used to solve each specific problem. Identification of doubts that need to be resolved in personalized tutorials.
Forum Index	The website for the course is included in the TEMA platform (http://faitic.uvigo.es). Subscription to this platform, including a photograph, is mandatory. The website provides all the information related to the course. It also publishes continuous assessment grades and runs forums for students to exchange ideas and discuss doubts.

Personalized attention

Methodologies	Description
Troubleshooting and / or exercises	Students will have the opportunity to attend personal tutorials in their lecturer□s office. These tutorials can be individual or in reduced groups (typically with a maximum of 2-3 students). Previous appointment with the corresponding professor will be requested and fixed by email, preferably in the schedules and place established by lecturers at the beginning of the academic year and published on the course website.

Practice in computer rooms	Students will have the opportunity to attend personal tutorials in their lecturer□s office. These tutorials can be individual or in reduced groups (typically with a maximum of 2-3 students). Previous appointment with the corresponding professor will be requested and fixed by email, preferably in the schedules and place established by lecturers at the beginning of the academic year and published on the course website.
Master Session	Students will have the opportunity to attend personal tutorials in their lecturer□s office. These tutorials can be individual or in reduced groups (typically with a maximum of 2-3 students). Previous appointment with the corresponding professor will be requested and fixed by email, preferably in the schedules and place established by lecturers at the beginning of the academic year and published on the course website.

Tests	**Description**
Reports / memories of practice	Students will have the opportunity to attend personal tutorials in their lecturer□s office. These tutorials can be individual or in reduced groups (typically with a maximum of 2-3 students). Previous appointment with the corresponding professor will be requested and fixed by email, preferably in the schedules and place established by lecturers at the beginning of the academic year and published on the course website.

Assessment

	Description	Qualification
Multiple choice tests	On the faitic website. In these tests the skill A3 will be evaluated.	7.5
Practical tests, real task execution and / or simulated.	Exam related to the work performed during several weeks of laboratory. In these tests the skill A5 will be evaluated.	7.5
Long answer tests and development	To evaluate theorical knowledges and problems resolution. In these tests the skills A3, A5 and A22 will be evaluated.	65
Short answer tests	Exam with questions and problems. In these tests the skill A3 will be evaluated.	5
Reports / memories of practice	Report about the perfomed work during several weeks in the computer classroom. In these tests the skill A5 will be evaluated.	15

Other comments on the Evaluation

CONTINUOUS ASSESSMENT

The continuous assessment consists of several activities. If the student can not do them in the fixed date, this activity will not be evaluated. The grades of these activities will be valid only for the present academic course.
If the student does the "Examen 1", she/he will be evaluated by continuous assessment.

Types and assessment of activities:

1. Exam 1 (Weight: 15%): weeks 7-8. It includes the subjects explained until this week.
2. Tests (Weight: 7.5%): developed along the course on the faitic website.
3. Exam of practices (Weight: 7.5%): week 6-7.
4. Short answer exam (Weight: 5%): week 13. It includes several subjects.
5. Lab project report (Weight: 15%): weeks 13 and 14.
6. Exam 2 (Weight: 50%): on the date of the final exam. It includes all the subjects, except those evaluated in the Exam 1 and the contents of lab projects.

The final grade will be the addition of all the activities results. To pass the course, students have to obtain, at least, five points.

NON CONTINUOUS ASSESSMENT

Students will be evaluated by means of an only exam, in the official date, if they don't do the □Exam 1□. The grades for this

final exam are between 0 and 10 points. It includes all the subjects of the course, including the laboratory works. Student can do the activities of Continuous Assessment, except the Exam 2.

June/July exam:

⇒ Students evaluated by Continuous Assessment can opt between two possibilities the same day of the exam:

1. Do again the Exam 2 and be evaluated according to the stipulated for the system of Continuous Assessment.
2. Be evaluated with an only final exam in the official date assigned by the Centre. The grades for this final exam are between 0 and 10 points. It includes all the subjects of the course, including the laboratory works.

⇒ Studentss not evaluated by Continuous Assessment:
The grades for this final exam are between 0 and 10 points. It includes all the subjects of the course, including the laboratory works.

Sources of information
Finn Jacobsen et al., **FUNDAMENTALS OF ACOUSTICS AND NOISE CONTROL**,
Lawrence Kinsler, Austin Frey, Alán Coppens, James Sanders, **FUNDAMENTALS OF ACOUSTICS**,
R. J. Clarke, **Digital Compression of Still Images and Video**,
T. Perales Benito, **Radio y Televisión Digitales: Tecnología de los Sistemas DAB, DVB, IBUC y ATSC**,
Ulrich Reimers, **DVB : the family of international standards for digital video broadcasting**,

In addition to the previous bibliography, students will be provided with:

* Documents for each subject: main material for an appropriate preparation of the course.
* Documents with the project's contents for each practise session.
* Copy of the graphic material used in the master sessions.
* Problems proposed: A set of problems recommended for each subject.

Recommendations
Subjects that continue the syllabus
(*)Acústica arquitectónica/V05G300V01635
(*)Fundamentos de enxeñaría acústica/V05G300V01531
(*)Fundamentos de procesado de imaxe/V05G300V01632
(*)Procesado de son/V05G300V01634
(*)Sistemas de audio/V05G300V01532
(*)Sistemas de imaxe/V05G300V01633
(*)Tecnoloxía audiovisual/V05G300V01631
(*)Vídeo e televisión/V05G300V01533
Subjects that are recommended to be taken simultaneously
(*)Técnicas de transmisión e recepción de sinais/V05G300V01404
Subjects that it is recommended to have taken before
(*)Física: Campos e ondas/V05G300V01202
(*)Física: Fundamentos de mecánica e termodinámica/V05G300V01102
(*)Procesado dixital de sinais/V05G300V01304
(*)Transmisión electromagnética/V05G300V01303