



IDENTIFYING DATA

Audio Systems

Subject	Audio Systems			
Code	V05G300V01532			
Study programme	(*)Grao en Enxeñaría de Tecnoloxías de Telecomunicación			
Descriptors	ECTS Credits	Choose	Year	Quadmester
	6	Optional	3rd	1st
Teaching language	Spanish			
Department				
Coordinator	Pena Giménez, Antonio			
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General description	The chain of audio systems is presented, from a systemic point of view. Each system is revised: configuration, specifications, quality figures and interaction with other systems.			

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
A43	CE34/SI1 The ability to construct, exploit and manage telecommunication services and applications, such as receiving, digital and analogical treatment, codification, transporting and representation, processing, storage, reproduction, management and presentation of audiovisual and multimedia information services.
A44	CE35/SI2 The ability to analyze, specify, carry out and maintain systems, equipments, heads and installations of TV, audio and video for mobile and fixed environments.
A46	CE37/SI4 The ability to carry out acoustic engineering projects related to: acoustical isolation and conditioning of rooms, loudspeaker installations, specification, analysis and selection of electro acoustical transducers, measurement, analysis and control of radio vibration systems, environmental acoustics, submarine and acoustical systems.
B3	The development of discussion ability about technical subjects

Learning aims

Expected results from this subject	Training and Learning Results	
Results of learning (SI2.1):	A3	B3
->Understand and discuss levels in audio systems	A44	
->Know the different types of audio amplifier, from a systems point of view. Discuss technical specifications to compare them.		
Results of learning (SI4.2):	A3	B3
-> Select a configuration for taking sound in different scenarios.	A46	

Results of learning (SI1.2):

A3

B3

-> Know and understand the operation of dynamic range processors and its application in a chain of audio systems.

-> Apply equalization techniques and other processes.

-> Schedule and carry out a mixture of sounds from the technical point of view, showing the knowledge of different tools to achieve an artistic result.

-> Discuss the influence of the available parameters of a digital audio format of audio in the final quality.

-> Explain several elements and interconnection protocols to allow the transport and synchronization of audio signals.

Results of learning (SI1.3):

-> Understand the basics of spatial audition and 3-d audio systems.

-> Understand the concept 'quality' in a given audio application

Contents

Topic	
Specifications.	Level meters. Impedances. Specifications.
Dynamic range and processes.	Dynamic range. Compressors and expanders. Filtering. Effects.
Amplifiers.	Types.Characterization.
Mixture of sounds.	Mixing table.. Bases of a mixture. Mixture in studio and live mixing. Mastering.
Sound take.	Types. Selecting a microphone. Configuration.
Sound quality.	Concept of quality. Estimate of quality.
Spatial audio (3-D).	Spatial audition. 3-d audio systems.
Digital audio.	Audio sampling systems. Specifications and sources of noise. Dithering. Synchronization and transport. MIDI.

Planning

	Class hours	Hours outside the classroom	Total hours
Practice in computer rooms	14	10.5	24.5
Outdoor study / field practices	0	7	7
Projects	7	52.5	59.5
Master Session	19	38	57
Short answer tests	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
Practice in computer rooms	Handle and adjustment of tools of analysis and algorithms, identifying which is appropriate for a given situation. Related competencies: A3, A43.
Outdoor study / field practices	Visits to places where the concepts discussed are applied (radio studio, recording studio, etc.). Due to availability and funding. Related competencies: A43.
Projects	Collaborative work in reduced groups. A complex design with a regular monitoring agenda. Role assignments, working in common, planning, technical reports and oral presentation. Related competencies: A3, B3, A43, A44.
Master Session	Oral speech, promoting the critical discussion of the concepts. Theoretical bases of algorithms and procedures used to solve problems are presented. Related competencies: A3, B3, A43, A44, A46.

Personalized attention

Methodologies	Description
Master Session	Tutoring to solve issues related to master sessions or lab practice is implemented: -> Individually or -> in reduced groups (no more than 2-3 students). E-mail confirmation to match the date of the appointment is needed. ----- During group projects an individualized tracking of the student is developed. Cross-avaliation within the group and autoavaliation may be used.
Practice in computer rooms	Tutoring to solve issues related to master sessions or lab practice is implemented: -> Individually or -> in reduced groups (no more than 2-3 students). E-mail confirmation to match the date of the appointment is needed. ----- During group projects an individualized tracking of the student is developed. Cross-avaliation within the group and autoavaliation may be used.
Projects	Tutoring to solve issues related to master sessions or lab practice is implemented: -> Individually or -> in reduced groups (no more than 2-3 students). E-mail confirmation to match the date of the appointment is needed. ----- During group projects an individualized tracking of the student is developed. Cross-avaliation within the group and autoavaliation may be used.

Assessment		
	Description	Qualification
Projects	Assessment of a collaborative work, developed along the semester, including a written report and oral presentation. Assessed competencies: A3, B3, A43, A44.	50
Short answer tests	Written test with short questions and problems to solve. Assessed competencies: A3, A43, A44, A46.	50

Other comments on the Evaluation

Following the guidelines of the studies, two evaluation systems will be offered to the students inscribed on this subject: continuous evaluation (the preferred method, academic activities are linked to this system) and evaluation at the end of the semester (not recommended).

*** "Students who choose continuous evaluation" conditions:**

A student follows the continuous evaluation system if she/he assigns a document that will be delivered and collected during weeks 1-3, so the collaborative work can begin.

Two tasks are evaluated. The approximate task calendar and the weight of each task in the final grade are listed below.

* Collaborative work in a group C (weight: 50%): during approx. 10 weeks each group develops a project. Some evidences are picked during this period (crossed evaluation, written test, etc.) and a final report must be delivered around week 11-12. An oral presentation, week 14, ends this activity.

* Written exam (weight: 50%): short questions related to group A and B activities, plus additional material. At the end of the semester, the same day when the final exam is planned.

If a student has participated in continuous evaluation and does not pass the course he/she will receive a grade of fail, regardless of he/she takes the written exam or not.

In order to ensure that students acquire a balanced minimum on the subject competences, they will pass the course if they meet these two conditions:

1) get a final mark equal to or greater than 5 (on a ten-points scale)

2) and a score equal to or greater than 4 (on the same scale) in each of the partial marks (written exam and collaborative group, respectively).

*** "Students who choose for evaluation at the end of the semester" conditions:**

The possibility of a final examination will be provided to students who do not opt for the continuous evaluation.

In order to ensure that students acquire a balanced minimum on the subject competences, they will pass the course if they meet both these two conditions:

1) get a final mark equal to or greater than 5 (on a ten-points scale)

2) and a score equal to or greater than 4 (on the same scale) in each of the sections of the exam. These sections, respectively, correspond with:

* contents included in all activities

* project developed in group, including group internals, management, writing of technical reports and oral presentations.

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Two different situations:

=> Students that are evaluated using continuous evaluation:

Two options to choose (just before the exam begins):

* repeat the written exam included in the continuous evaluation planning and be evaluated under the "Students who choose continuous evaluation" conditions, described above.

* be evaluated with the same final exam of students who choose for evaluation at the end of the semester, under the "Students who choose for evaluation at the end of the semester" evaluation conditions, described above. No other activities are considered.

=> Students who choose for evaluation at the end of the semester:

A final examination will be provided to students who do not opt for the continuous evaluation, and are evaluated under the "Students who choose for evaluation at the end of the semester" conditions, described above. No other activities are considered.

Sources of information

Bruce and Jenny Bartlett, **Practical recording techniques**, 2005,

Francis Rumsey and Tim McCormick, **Sound and recording**, 2009,

Davis, Gary, **The Sound reinforcement handbook**, 2nd edition,

Philip Giddings, **Audio systems: design and installation**, 1990,

In addition to the bibliography mentioned the student will have as a support material:

- * Scripts of theory: material that contains the theoretical base of what is included in the master sessions.
- * Scripts of the practices: proposed activities and problems of each practical session.
- * Copy of the slides.
- * Questions and problems proposed.

Recommendations

Subjects that continue the syllabus

Sound Processing/V05G300V01634

Audiovisual Technology/V05G300V01631

Subjects that are recommended to be taken simultaneously

Fundamentals of Acoustics Engineering/V05G300V01531

Subjects that it is recommended to have taken before

Fundamentals of Sound and Image/V05G300V01405

Digital Signal Processing/V05G300V01304
