

ADVANCED AUDIOVISUAL SYSTEMS

20031 - ADVANCED AUDIOVISUAL SYSTEMS (2023-24)

General

Code: 20031

Lecturer responsible:

ROMA ROMERO, MIGUEL

Credits ECTS:

6,00

Theoretical credits:

0,90

Practical credits:

1,50

Distance-base hours:

3,60

Departments involved

- **Dept:** PHYSICS, ENGINEERING SYSTEMS AND SIGNAL THEORY

Area: SIGNAL THEORY AND COMMUNICATIONS

Theoretical credits: 0,9

Practical credits: 1,5

This Dept. is responsible for the course.

This Dept. is responsible for the final mark record.

Study programmes where this course is taught

- [DEGREE IN SOUND AND IMAGE IN TELECOMMUNICATION ENGINEERING](#)
Course type: COMPULSORY (Year: 4)

Competencies and objectives

Course context for academic year 2023-24

With the previous courses in which Audio-visual technology is presented (mainly Television, Video Engineering and Digital Audio Processing), we will try to explore the newest developments related to production, broadcast and coding in audio and video production environments. The problems of the last tools used in design, simulation and optimization of large scale sound reinforcement systems will also be covered. The course is structured in general in the development of projects related with the goals of the course.

RECOMMENDATIONS - Courses that must be done previously:

- Television
- Digital signal processing
- Digital audio processing
- Digital image processing
- Video engineering

UA Basic Transversal Competences

- **CT10** : Capacitat d'afrontar, projectar i resoldre problemes reals demanats per la societat en l'àmbit de l'enginyeria.
- **CT11** : Capacitat d'aprendre i aplicar, de manera autònoma i interdisciplinària, nous conceptes i mètodes.
- **CT12** : Capacitat d'assimilar l'evolució contínua de la tecnologia en l'àmbit de desenvolupament professional i adaptar-s'hi.
- **CT13** : Capacitat d'adoptar el mètode científic en el plantejament i realització de treballs diversos tant en l'àmbit acadèmic com en el professional.
- **CT14** : Disposar de la capacitat d'autocrítica necessària per a l'anàlisi i millora de la qualitat d'un projecte.
- **CT6** : Capacitat d'utilitzar la llengua anglesa amb fluïdesa per a accedir a la informació tècnica, respondre a les necessitats de la societat, i poder ser autosuficient en la preparació de la seua vida professional.
- **CT7** : Capacitat d'exposició oral i escrita.
- **CT8** : Capacitat de planificar tasques i comprometre's en el compliment d'objectius i terminis.
- **CT9** : Capacitat de treball en grup.

Basic Transversal Competences

- **CT2** : Que els estudiants sàpien aplicar els seus coneixements al seu treball o vocació d'una forma professional i posseïsquen les competències que solen demostrar-se per mitjà de l'elaboració i defensa d'arguments i la resolució de problemes dins de la seua àrea d'estudi.
- **CT3** : Que els estudiants tinguen la capacitat de reunir i interpretar dades rellevants (normalment dins de la seua àrea d'estudi) per a emetre judicis que incloguen una reflexió sobre temes rellevants d'índole social, científica o ètica.
- **CT4** : Que els estudiants puguen transmetre informació, idees, problemes i solucions a un públic tant especialitzat com no especialitzat.
- **CT5** : Que els estudiants hagen desenvolupat aquelles habilitats d'aprenentatge necessàries per a emprendre estudis posteriors amb un alt grau d'autonomia.

Specific Competences: >> Competences Common to the Telecommunications Branch

- **C1** : Capacitat per a aprendre de manera autònoma nous coneixements i tècniques adequats per a la concepció, el desenvolupament o l'explotació de sistemes i serveis de telecomunicació.
- **C2** : Capacitat d'utilitzar aplicacions de comunicació i informàtiques (ofimàtiques, bases de dades, càlcul avançat, gestió de projectes, visualització, etc.) per a sustentar el desenvolupament i l'explotació de xarxes, serveis i aplicacions de telecomunicació i electrònica.
- **C3** : Capacitat per a utilitzar eines informàtiques de recerca de recursos bibliogràfics o d'informació relacionada amb les telecomunicacions i l'electrònica.
- **C5** : Capacitat per a avaluar els avantatges i inconvenients de diferents alternatives tecnològiques de desplegament o implementació de sistemes de comunicacions, des del punt de vista de l'espai del senyal, les perturbacions i el soroll i els sistemes de modulació analògica i digital.

Specific Competences: >> Competences Specific to Sound and Image

- **E1** : Capacitat de construir, explotar i gestionar serveis i aplicacions de telecomunicacions, enteses aquestes com a sistemes de captació, tractament analògic i digital, codificació, transport, representació, processament,

emmagatzematge, reproducció, gestió i presentació de serveis audiovisuals i informació multimèdia.

- **E2** : Capacitat d'analitzar, especificar, realitzar i mantenir sistemes, equips, capçaleres i instal·lacions de televisió, àudio i vídeo, tant en entorns fixos com a mòbils.
- **E5** : Capacitat per a crear, codificar, gestionar, difondre i distribuir continguts multimèdia, atenent criteris d'usabilitat i accessibilitat dels serveis audiovisuals, de difusió i interactius.

Exclusive skill taught in this course

No data

Learning outcomes (Training objectives)

No data

Specific objectives stated by the academic staff for academic year 2023-24

- Students will know the newest trends in production, coding and broadcasting of audio-visual signals.
- Students will understand digital, high definition and 3D television systems.
- Students will know coding and reproduction of multi-channel and surround audio systems.
- Students will know the principles of designing, optimization and verification of large scale sound reinforcement systems.
- Students will be concerned about the challenges and social implications of the engineering work.

Content for academic year 2023-24

PART 1. Audio-visual technology.

- 1.1. 3D Cine and Television.
- 1.2. Internet video.
- 1.3. Digital cine and high definition video.
- 1.4.- Audio coding and compression.
- 1.5.- Voice over IP.
- 1.6.- Smart TV.
- 1.7.- Multichannel, surround and immersive audio.

Common competences to Part 1: CT2 a CT14, C1 a C3, C5, E1, E2, E5

PART 2. Design and optimization of sound reinforcement systems.

- 2.1.- Introduction.
- 2.2.- Specific processing tools in sound reinforcement systems.
- 2.3.- Design and simulation sound reinforcement tools.
- 2.4.- Filters and phase response.
- 2.5.- Measuring and optimization of reinforcement systems.

Common competences in Part 2: CT2 a CT14, C1 a C3, C5, E1, E2, E5

PART 3. Relationship between engineering and society.

- 3.1.- Technological chain. Raw materials and waste management.
- 3.2.- Social implications of engineering.

Common competences to Part 3: CT2 a CT14, C1 a C3, C5, E1, E2, E5

LABORATORY SESSIONS:

In the laboratory sessions the next items will be developed:

- Implementation of the experimental part corresponding to the research projects.
- Work with specific equipment for quality measurement of digital video.
- Implementation and optimization of special sound reinforcement systems.

Related links

No data

Audio metering : measurements, standards and practice

Author(s): Brixen, Eddy B.

Issue: New York : Routledge, 2020;

ISBN: 1-315-69415-8 (libro e.)

Category: Básico

Configuración y ajustes de sistemas de sonido : Curso práctico

Author(s): Digón, Albert G.

Issue: Tarragona : Altaria, 2014;

ISBN: 978-84-941844-7-5

Category: Básico

Control de sonido directo

Author(s): DIGÓN, Albert G. ; SUAREZ, Nico ; MARTÍN, Daniel A.

Issue: Tarragona : Altaria, 2016;

ISBN: 978-84-945683-0-5

Category: Básico

Digital video and audio broadcasting technology : a practical engineering guide

Author(s): Fischer, Walter

Issue: Berlin : Springer, 2010;

ISBN: 978-3642116117

Category: Básico

A broadcast engineering tutorial for non-engineers

Author(s): Pizzi, Skip

Issue: Burlington. MA : Focal Press, 2014;

ISBN: 0-415-73339-1

Category: Complementario

Espectáculos audiovisuales : Guía técnica de producción en exteriores

Author(s): Martín Díaz, Daniel Alberto

Issue: - : Domibari Canarias SLU, 2014;

ISBN: 978-84-617-2199-3

Category: Básico

Sistemas de sonido, diseño y optimización : técnicas y herramientas modernas para el diseño y alineación de sistemas de sonido

Author(s): McCarthy, Bob

Issue: - : Alvalena, 2009;

ISBN: 978-84-936269-2-1

Category: Básico

Digital video and HD : algorithms and interfaces

Author(s): Poynton, Charles A.

Issue: Amsterdam : Morgan Kaufmann Publishers, 2012;

ISBN: 978-0123919328

Category: Básico

Broadcast engineer`s reference book

Author(s): Tozer, Henry Fanshawe

Issue: New York : Focal Press, 2013;

ISBN: 978-1136024177

Category: Básico

The art of digital video

Author(s): Watkinson, John

Issue: Oxford : Focal Press, 2008;

ISBN: 978-0-240-52005-6

Category: Básico

El line array. Tratado completo de ajustes de sistemas de sonorización: Volume 1

Author(s): MARTÍ FAUS, José

Issue: - : Createspace Independent Pub, 2017;

ISBN: 978-1542438698

Category: Complementario

Assessment

Assessment procedures and criteria 2023-24

Ordinary period:

Mark = 0.3 Proj 1 + 0.3 Proj 2 + 0.3 Work + 0.1 Seminary

Notes:

- The report of Project 2 will be delivered before the exams period and after the class period.
- The dates for submission of work are indicative, because the calendar is done once the working groups are organized.
- The continuous assessment marks, including problems and projects, will be taken into account in the extraordinary period. The final mark will be obtained using the same ponderation as in the ordinary period.
- *"The works done during the course must be original. If copy is detected the related mark will be "0". The department and EPS will be informed about this issue. The repetition in this behavior in this or any other subject entail notifying the relevant university vicepresident of the misconduct to study the case and punish according to the law (Regulation of academic discipline of officers Centers Higher Education and Technical Education under the Ministry of National education BOE 12/10/1954)."*

Extraordinary period:


Mark = 0.3 Proj 1 + 0.3 Proj 2 + 0.3 Work + 0.1 Seminary

Notes:

- Items with passed mark will preserve the mark of the ordinary period.
- Non passed items will be delivered again (the corresponding mark will be obtained just from the reports)

Description	Criteria	Type	Weighting system
Theory sessions	Profit of the seminars, active participation (10%) and development of the research project (30%). The presentations of the research project will be distributed along the semester, varying depending on the number of working groups (approx. weeks 11 to 15).	ACTIVITIES OF EVALUATION DURING THE SEMESTER	40
Computer lab	Development of the sessions and report and presentation of results of project 1 Week: 08.	ACTIVITIES OF EVALUATION DURING THE SEMESTER	30
Laboratory sessions	Development of lab sessions and delivery of the results of project 2. Week:15 (results presentation). The delivery of the report of the project 2 will be done during the exams period.	ACTIVITIES OF EVALUATION DURING THE SEMESTER	30

Official exam dates for academic year 2023-24

Exam session	Date	Time	Group - Classroom(s) allocated	Comments
(C2) Periodo ordinario para asignaturas de primer semestre	10/01/2024	12:00 - 15:00	EP/S...10P. 	Teoría
(C4) Pruebas extraordinarias para asignaturas de grado y máster	04/07/2024			Teoría

Academic staff



ROMA ROMERO, MIGUEL

Lecturer responsible

THEORY CLASS: Groups: 1 , 2

LAB PRACTICALS: Groups: 1 , 2 , 3

COMPUTER PRACTICALS: Groups: 1 , 2

Groups

THEORY CLASS

Group	Semester	Morning or afternoon session	Language	No. of enrolled students	
Gr. 1 (THEORY CLASS) : 1 (ARA)	1S	Afternoon	English	7	<ul style="list-style-type: none">Allowed DEGREE IN SOUND AND IMAGE IN TELECOMMUNICATION ENGINEERINGAllowed INTERNATIONAL MOBILITY PROGRAMME
Gr. 2 (THEORY CLASS) : 2	1S	Morning	Spanish	17	<ul style="list-style-type: none">Allowed DEGREE IN SOUND AND IMAGE IN TELECOMMUNICATION ENGINEERING

LAB PRACTICALS



Group	Semester	Morning or afternoon session	Language	No. of enrolled students	
Gr. 1 (LAB PRACTICALS) : 1 (ARA)	1S	Afternoon	English	7	<ul style="list-style-type: none">Allowed DEGREE IN SOUND AND IMAGE IN TELECOMMUNICATION ENGINEERINGAllowed INTERNATIONAL MOBILITY PROGRAMME
Gr. 2 (LAB PRACTICALS) : 2	1S	Morning	Spanish	17	
Gr. 3 (LAB PRACTICALS) : 3	1S	Morning	Spanish	0	<ul style="list-style-type: none">Allowed INTERNATIONAL MOBILITY PROGRAMMEAllowed DEGREE IN SOUND AND IMAGE IN TELECOMMUNICATION ENGINEERING

COMPUTER PRACTICALS




Group	Semester	Morning or afternoon session	Language	No. of enrolled students	
Gr. 1 (COMPUTER PRACTICALS) : 1 (ARA)	1S	Afternoon	English	7	<ul style="list-style-type: none">Allowed INTERNATIONAL MOBILITY PROGRAMMEAllowed DEGREE IN SOUND AND IMAGE IN TELECOMMUNICATION ENGINEERING
Gr. 2 (COMPUTER PRACTICALS) : 2	1S	Morning	Spanish	17	
Gr. 3 (COMPUTER PRACTICALS) : 3	1S	Morning	Spanish	0	

Timetables



THEORY CLASS

Group	Start date	End date	Day	Start time	End time	Lecture room
1	11/09/2023	22/12/2023	JUE	15:00	16:30	0016P2008 
2	11/09/2023	22/12/2023	JUE	10:00	11:30	0016P1008 

LAB PRACTICALS

Group	Start date	End date	Day	Start time	End time	Lecture room
1	26/10/2023	21/12/2023	JUE	16:30	19:00	0013PB008 
2	24/10/2023	19/12/2023	MAR	10:30	13:00	0013PB008 
3	23/10/2023	18/12/2023	LUN	10:00	12:30	0013PB008 

COMPUTER PRACTICALS

Group	Start date	End date	Day	Start time	End time	Lecture room
1	14/09/2023	19/10/2023	JUE	16:30	19:00	0013PB008 
2	12/09/2023	17/10/2023	MAR	10:30	13:00	0013PB008 
3	11/09/2023	16/10/2023	LUN	10:00	12:30	0013PB008 