

VIDEO ENGINEERING

20025 - VIDEO ENGINEERING (2024-25)

General

Code: 20025

Lecturer responsible:

ROMA ROMERO, MIGUEL

Credits ECTS:

6,00

Theoretical credits:

0,60

Practical credits:

1,80

Distance-base hours:

3,60

Departments involved

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

Area: SIGNAL THEORY AND COMMUNICATIONS

Theoretical credits: 0,6

Practical credits: 1,8

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: 3)

Competencies and objectives

Course context for academic year 2024-25

Video engineering presents a deep review of both the technical staff used in video production and their usual configurations. It is based in the contents covered in Digital Image Processing, and emphasizes in video processing in professional systems. The course is structured in a realistic scheme, replicating way of work in video engineering in production facilities.

It is recommended to study this subject after passing the following ones:

- Fundamentals of engineering optics
- Digital signal processing
- Television
- Digital imagen processing

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.
- **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 2024-25

Students should know the possibilities and limitatios of professional video production equipment.

Students should be able to implement imagen processing algorithms, inside a realistic audio-visual engineering working environment.

Students should be able to design real production configurations.

Students should know how to determine the quality of systems and signals by means of specific measurment equipment.

Content and bibliography

Content for academic year 2024-25

PART 1. Video signal generation.

Unit 1. Video cameras

- 1.1. Introduction
- 1.2. Vacuum tube cameras
- 1.3. Solid state sensor cameras

Unit 2. Telecines

- 2.1.- Introduction
- 2.2.- Clasification of Telecines

Competences: CT2, CT4 a CT14, C1 a C3, C5, E1, E2, E5

Part 2. Techniques and equipment for video production.

Unit 3. Videoe production equipment

- 3.1.- Introduction
- 3.2.- Video switcher
- 3.3.- Auxiliary equipment
- 3.4.- Signal routing devices

Unit 4. Video control devices

- 4.1.- Introduction
- 4.2.- Waveform monitor
- 4.3.- Vectorscope UV
- 4.4.- Lighting vectorscope
- 4.5.- Diamond vectorscopio
- 4.6.- Arrowhead vectorscope
- 4.7.- LVQ and SpearHead monitors

Competences: CT2, CT4 a CT14, C1 a C3, C5, E1, E2, E5

Related links

No data

A broadcast engineering tutorial for non-engineers

Author(s): Pizzi, Skip

Issue: Burlington. MA : Focal Press, 2014;

ISBN: 0-415-73339-1

Category: Complementario

An Introduction to video and audio measurement

Author(s): Hodges, Peter

Issue: Burlington : Focal Press, 2013;

ISBN: 9781136036576

Category: Básico

Broadcast engineer`s reference book

Author(s): Tozer, Henry Fanshawe

Issue: New York : Focal Press, 2013;

ISBN: 978-1136024177

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

Digital video and audio broadcasting technology : a practical engineering guide

Author(s): Fischer, Walter

Issue: Berlin : Springer, 2010;

ISBN: 978-3642116117

Category: Básico

Equipos de procesado y medida para tratamiento de imagen

Author(s): Ortiz Berenguer, Luis I.

Issue: Madrid : E.U.I.T. de Telecomunicación, 2001;

ISBN: 84-95227-21-5

Category: Básico

Ingeniería de vídeo

Author(s): Luis I. Ortiz Berenguer

Issue: Madrid : Escuela Universitaria de Ingeniería Técnica de Telecomunicación, Departamento de, cop.1998;

ISBN: 84-86892-88-0

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: Complementario

The art of digital video

Author(s): Watkinson, John

Issue: Oxford : Focal Press, 2008;

ISBN: 978-0-240-52005-6

Category: Básico

Video Camera Technology

Author(s): Luther, Arch C.

Issue: Norwood : Artech House Publishers, 1998;

ISBN: 0-89006-556-X

Assessment

Assessment procedures and criteria 2024-25

Ordinary period:

- In order to pass the course, the mark in the Final Exam and the classroom questions will be necessarily equal or greater than 4 over 10.

- The final mark will be obtained with: laboratory work (17.5%), projects (17.5%), questions in theory sessions (35%) and final exam (30%).

Comments:

"The detection of copy or plagiarism will be marked "0" in the corresponding test. The Department and the Polytechnic School or Faculty will be informed about this incident. The reiteration in the conduct in this or other subject will entail the notification to the corresponding vice-rector of the faults committed so that they study the case and sanction according to the legislation."

During their sessions, some questions will be done and delivered.

During the project 1 period (weeks 4,5,6) there will be minor deliveries with deadline and marginal value not included in the planning.

During the ordinary evaluation period the report corresponding to lab sessions 3 and 4 and the self-assessment document will be delivered.

Extraordinary periods:

- In order to pass the course, the mark in the Final Exam and the classroom questions will be necessarily equal or greater than 4 over 10.

- The final mark will be obtained with: laboratory work (35/2%), projects (35/2%), questions in theory sessions (35%) and final exam (30%).

Comments:

The continuous assessment marks, including problems and projects, will be taken into account in the extraordinary period.

If the projects and/or theory questions are not done (or passed) laboratory sessions will be taken into account, and the rest of marks will be assessed in the exam:

Mark = Final exam (50%) + Projects and Questions exam (40%) + Laboratory marks (10%).

In this case it will be necessary to get a mark equal or greater than 4 over 10 in the final exam.

Description	Criteria	Type	Weighting system
Theory session	Delivery of a written report with the questions solved during the session. Pending questions won't have a fixed delivery date.	ACTIVITIES OF EVALUATION DURING THE SEMESTER	35
Laboratory session	Delivery of the results of the projects (deliverables weeks 5, 6, 7, y 9 (project 1) and 14 (project 2)) and written report of the laboratory experiences. (Weeks 05 (P1), 10 (P2) and after the class period (P3 and P4)).	ACTIVITIES OF EVALUATION DURING THE SEMESTER	17,5
Problem solving session	Delivery of the results of the projects (deliverables weeks 5, 6, 7, y 9 (project 1) y 14 (project 2)) and problems to be delivered in each session. and written report of the laboratory experiences. Pending problems won't have a fixed delivery date.	ACTIVITIES OF EVALUATION DURING THE SEMESTER	17,5
Final exam	Final exam consisting of 8-10 multiple selection tests and 3-4 problems and/or practical cases.	FINAL TEST	30

Official exam dates for academic year 2024-25

Exam session	Date	Time	Group - Classroom(s) allocated	Comments
(C3) Periodo ordinario para asignaturas de segundo semestre y anuales	06/06/2025			Teoría
(C4) Pruebas extraordinarias para asignaturas de grado y máster	09/07/2025			Teoría

Academic staff



ROMA ROMERO, MIGUEL

Lecturer responsible

THEORY CLASS: Groups: 1

LAB PRACTICALS: Groups: 1

PROBLEM PRACTICALS / WORKSHOP: Groups: 1



SIGNES GOMEZ, JOSE ANTONIO

THEORY CLASS: Groups: 2

PROBLEM PRACTICALS / WORKSHOP: Groups: 2



VALLE SANCHEZ, ANTONIO

LAB PRACTICALS: Groups: 2 , 3

Groups

THEORY CLASS

Group	Semester	Morning or afternoon session	Language	No. of enrolled students	
Gr. 1 (THEORY CLASS) : 1 (ARA)	2S	Morning	English	11	▪ Allowed DEGREE IN SOUND AND IMAGE IN TELECOMMUNICATION ENGINEERING
Gr. 2 (THEORY CLASS) : 2	2S	Morning	Spanish	28	▪ 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)	2S	Morning	English	11	▪ Allowed DEGREE IN SOUND AND IMAGE IN TELECOMMUNICATION ENGINEERING
Gr. 2 (LAB PRACTICALS) : 2	2S	Afternoon	Spanish	15	▪ Allowed DEGREE IN SOUND AND IMAGE IN TELECOMMUNICATION ENGINEERING
Gr. 3 (LAB PRACTICALS) : 3	2S	Afternoon	Spanish	13	▪ Allowed DEGREE IN SOUND AND IMAGE IN TELECOMMUNICATION ENGINEERING

PROBLEM PRACTICALS / WORKSHOP




Group	Semester	Morning or afternoon session	Language	No. of enrolled students	
Gr. 1 (PROBLEM PRACTICALS / WORKSHOP) : 1 (ARA)	2S	Morning	English	11	▪ Allowed DEGREE IN SOUND AND IMAGE IN TELECOMMUNICATION ENGINEERING
Gr. 2 (PROBLEM PRACTICALS / WORKSHOP) : 2	2S	Afternoon	Spanish	28	▪ Allowed DEGREE IN SOUND AND IMAGE IN TELECOMMUNICATION ENGINEERING

Timetables



THEORY CLASS

Group	Start date	End date	Day	Start time	End time	Lecture room
1	27/01/2025	23/05/2025	MAR	09:00	10:00	0016P2008 
2	27/01/2025	23/05/2025	MIE	14:30	15:30	0016P2001 

LAB PRACTICALS

Group	Start date	End date	Day	Start time	End time	Lecture room
1	27/01/2025	23/05/2025	MAR	10:30	12:00	0013PB008 
2	27/01/2025	23/05/2025	LUN	17:00	18:30	0013PB008 
3	27/01/2025	23/05/2025	MIE	17:00	18:30	0013PB008 

PROBLEM PRACTICALS / WORKSHOP

Group	Start date	End date	Day	Start time	End time	Lecture room
1	27/01/2025	23/05/2025	MAR	12:00	13:00	A2/C02 
1	27/01/2025	23/05/2025	MAR	10:00	10:30	0016P2008 
2	27/01/2025	23/05/2025	MIE	15:30	17:00	0016P2001 