



POLITÉCNICA

INTERNATIONAL  
CAMPUS OF  
EXCELLENCE

COORDINATION PROCESS OF  
LEARNING ACTIVITIES  
PR/CL/001



E.T.S. de Ingenieros de  
Telecomunicacion

# ANX-PR/CL/001-01

## LEARNING GUIDE

### SUBJECT

**93000806 - Audiovisual production environments**

### DEGREE PROGRAMME

09AQ - Master Universitario en Ingeniería de Telecomunicacion

### ACADEMIC YEAR & SEMESTER

2017/18 - Semester 2

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## 1. Description

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### 1.1. Subject details

<b>Name of the subject</b>	93000806 - Audiovisual production environments
<b>No of credits</b>	6 ECTS
<b>Type</b>	Optional
<b>Academic year of the programme</b>	Second year
<b>Semester of tuition</b>	Semester 4
<b>Tuition period</b>	February-June
<b>Tuition languages</b>	English
<b>Degree programme</b>	09AQ - Master Universitario en Ingenieria de Telecomunicacion
<b>Centre</b>	Escuela Tecnica Superior de Ingenieros de Telecomunicacion
<b>Academic year</b>	2017-18

## 2. Faculty

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### 2.1. Faculty members with subject teaching role

<b>Name and surname</b>	<b>Office/Room</b>	<b>Email</b>	<b>Tutoring hours *</b>
Fco. Javier Casajus Quiros	C-328	javier.casajus@upm.es	Tu - 08:00 - 10:00 W - 08:00 - 10:00 Th - 08:00 - 10:00
Jose Manuel Menendez Garcia (Subject coordinator)	C-300	jm.menendez@upm.es	Tu - 08:00 - 10:00 W - 08:00 - 10:00 Th - 08:00 - 10:00

Jose Luis Blanco Murillo	C-303	jl.blanco@upm.es	Tu - 08:00 - 10:00 W - 08:00 - 10:00 Th - 08:00 - 10:00
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\* The tutoring schedule is indicative and subject to possible changes. Please check tutoring times with the faculty member in charge.

### 3. Prior knowledge recommended to take the subject

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#### 3.1. Recommended (passed) subjects

- Sistemas y servicios multimedia

#### 3.2. Other recommended learning outcomes

- Multimedia Production. Elective subject. Mandatory for the students willing to major in Sound and Image. Fourth year of the Bachelor of Engineering in Telecommunication Technologies and Services Eng.

- Audiovisual Equipment and Systems. Elective subject. Mandatory for the students willing to major in Sound and Image. First semester of the 4th. year of the Bachelor of Engineering in Telecommunication Technologies and Services Eng.

### 4. Skills and learning outcomes \*

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#### 4.1. Skills to be learned

CE1 - Capacidad para aplicar métodos de la teoría de la información, la modulación adaptativa y codificación de canal, así como técnicas avanzadas de procesamiento digital de señal a los sistemas de comunicaciones y audiovisuales.

CE15 - Capacidad para la integración de tecnologías y sistemas propios de la Ingeniería de Telecomunicación, con carácter generalista, y en contextos más amplios y multidisciplinares como por ejemplo en bioingeniería, conversión fotovoltaica, nanotecnología, telemedicina.

CE16 - Capacidad para la elaboración, dirección, coordinación, y gestión técnica y económica de proyectos sobre: sistemas, redes, infraestructuras y servicios de telecomunicación, incluyendo la supervisión y coordinación de los proyectos parciales de su obra aneja; infraestructuras comunes de telecomunicación en edificios o núcleos

residenciales, incluyendo los proyectos sobre hogar digital; infraestructuras de telecomunicación en transporte y medio ambiente; con sus correspondientes instalaciones de suministro de energía y evaluación de las emisiones electromagnéticas y compatibilidad electromagnética.

CE4 - Capacidad para diseñar y dimensionar redes de transporte, difusión y distribución de señales multimedia.

CE6 - Capacidad para modelar, diseñar, implantar, gestionar, operar, administrar y mantener redes, servicios y contenidos.

CG2 - Que los estudiantes sepan aplicar los conocimientos adquiridos y su capacidad de resolución de problemas en entornos nuevos o poco conocidos dentro de contextos más amplios (o multidisciplinares) relacionados con su área de estudio.

CG4 - Que los estudiantes sepan comunicar sus conclusiones y los conocimientos y razones últimas que las sustentan a públicos especializados y no especializados de un modo claro y sin ambigüedades.

CG5 - Que los estudiantes posean las habilidades de aprendizaje que les permitan continuar estudiando de un modo que habrá de ser en gran medida autodirigido o autónomo.

CT1 - Capacidad para comprender los contenidos de clases magistrales, conferencias y seminarios en lengua inglesa.

CT2 - Capacidad para dinamizar y liderar equipos de trabajo multidisciplinares.

CT3 - Capacidad para adoptar soluciones creativas que satisfagan adecuadamente las diferentes necesidades planteadas.

CT4 - Capacidad para trabajar de forma efectiva como individuo, organizando y planificando su propio trabajo, de forma independiente o como miembro de un equipo.

CT5 - Capacidad para gestionar la información, identificando las fuentes necesarias, los principales tipos de documentos técnicos y científicos, de una manera adecuada y eficiente.

## 4.2. Learning outcomes

RA23 - Capacidad de abordar la gestión de un proyecto de ingeniería sencillo, en todas sus fases: planificación, asignación de recursos, estudio de la viabilidad económica y seguimiento y control. (CG1, CG2, CT3)

RA228 - Manejar algunas de las herramientas informáticas fundamentales para la implementación de algoritmos de Tratamiento Digital de Vídeo

RA229 - Conocimiento de las aplicaciones basadas en el análisis y tratamiento espacio-temporal de la señal de vídeo

RA9 - Saber redactar informes técnicos sobre trabajos realizados, con una estructura, contenidos y lenguaje del nivel adecuado a un trabajo de ingeniería

RA14 - El alumno conoce y es capaz de cuantificar los principales parámetros que definen los requisitos de los tráfico multimedia, estableciendo un compromiso calidad/coste y es capaz de aplicarlo al dimensionado de las redes de soporte.

RA10 - Saber realizar una presentación de carácter técnico, ante una audiencia de pares, que describa el trabajo realizado y sus resultados, de forma clara y bien estructurada, en el tiempo establecido, y usando un lenguaje preciso

RA45 - Conocimiento de las técnicas de captación, representación, tratamiento, almacenamiento, compresión, transporte, y presentación que se utilizan en los servicios y aplicaciones multimedia

RA44 - Conocimiento y caracterización de los elementos de los sistemas multimedia

RA13 - El alumno es capaz de conocer la estructura, elementos y prestaciones de las redes de distribución de contenidos.

RA25 - P ráctica de habilidades transversales necesarias para la gestión y participación en proyectos de ingeniería. (CG4, CT2, CT4)

RA43 - Conocimiento de los problemas prácticos que pueden resolverse mediante sistemas multimedia

RA46 - Conocimiento las técnicas y herramientas necesarias para analizar, especificar, implantar y mantener sistemas y servicios multimedia

RA47 - Conocimiento de las técnicas requeridas para la manipulación y distribución de contenidos multimedia: creación, codificación, gestión, transporte y difusión

RA49 - Manejo de las herramientas informáticas requeridas para la implantación y gestión de sistemas y servicios

multimedia

RA227 - Manejar las herramientas matemáticas y conceptuales que sirven de base a las técnicas de Tratamiento Digital de Vídeo

\* The Learning Guides should reflect the Skills and Learning Outcomes in the same way as indicated in the Degree Verification Memory. For this reason, they have not been translated into English and appear in Spanish.

## 5. Brief description of the subject and syllabus

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### 5.1. Brief description of the subject

Elective subject. Mandatory for the students willing to major in Sound and Image. It includes the study of the media production integrated environments, describing their main functional areas, and covering design aspects (fulfilling functional requirements according to the pre-defined technical specifications), deployment, production, exploitation and maintenance. The subject has a strong practical component aim, and so it is complemented with several laboratory exercises, according to the Project Based Learning philosophy. The students will be organised in small groups that must properly structure and coordinate themselves to be able to cover all the functional aspects that the exercises require, in a given time slot. Resources from the Laboratory of Signals and Communications will be used, including workstations with video and audio editing capabilities, and a compact production studio equipped with a stage, high quality video cameras and multi-channel audio acquisition capabilities,

## 5.2. Syllabus

1. Introduction to the audio-visual production environments
2. Design of media production centers
3. Deployment of media production centers
4. Production and exploitation of media production centers
5. Maintenance, updating and upgrading of media production centers



## 6. Schedule

### 6.1. Subject schedule\*

Week	Face-to-face classroom activities	Face-to-face laboratory activities	Other face-to-face activities	Assessment activities
1	<p><b>Chapter 1</b> Duration: 02:00 Lecture</p> <p><b>Chapter 2</b> Duration: 02:00 Lecture</p>			
2	<p><b>Chapter 2</b> Duration: 02:00 Lecture</p> <p><b>Chapter 2</b> Duration: 02:00 Lecture</p>			
3		<p><b>Laboratory Exercise: Multi-channel high quality audio acquisition, and operation of the audio console</b> Duration: 02:00 Laboratory assignments</p> <p><b>Laboratory Exercise: Multi-channel high quality audio acquisition, and operation of the audio console</b> Duration: 02:00 Laboratory assignments</p>		<p><b>Collaborative work. Presentation of the laboratory exercise memory in time, following the specified procedure, to allow a continuous evaluation.</b> Group work Continuous assessment Duration: 04:00</p>
4	<p><b>Chapter 3</b> Duration: 02:00 Lecture</p> <p><b>Chapter 3</b> Duration: 02:00 Lecture</p>			
5		<p><b>Laboratory Exercise: Multi-camera high quality video acquisition, and operation of the video console</b> Duration: 02:00 Laboratory assignments</p> <p><b>Laboratory Exercise: Multi-camera high quality video acquisition, and operation of the video console</b> Duration: 02:00 Laboratory assignments</p>		<p><b>Collaborative work. Presentation of the laboratory exercise memory in time, following the specified procedure, to allow a continuous evaluation.</b> Group work Continuous assessment Duration: 04:00</p>

6	<p><b>Chapter 3</b> Duration: 02:00 Lecture</p> <p><b>Chapter 4</b> Duration: 02:00 Lecture</p>			
7		<p><b>Laboratory Exercise: Titling, graphics and acquisition of raw audio-visual material.</b> Duration: 02:00 Laboratory assignments</p> <p><b>Laboratory Exercise: Titling, graphics and acquisition of raw audio-visual material.</b> Duration: 02:00 Laboratory assignments</p>		<p><b>Collaborative work. Presentation of the laboratory exercise memory in time, following the specified procedure, to allow a continuous evaluation.</b> Group work Continuous assessment Duration: 04:00</p>
8	<p><b>Chapter 4</b> Duration: 02:00 Lecture</p> <p><b>Chapter 4</b> Duration: 02:00 Lecture</p>			
9		<p><b>Laboratory Exercise: Streaming of audio-visual off-line and on-line content</b> Duration: 02:00 Laboratory assignments</p> <p><b>Laboratory Exercise: Streaming of audio-visual off-line and on-line content</b> Duration: 02:00 Laboratory assignments</p>		<p><b>Collaborative work. Presentation of the laboratory exercise memory in time, following the specified procedure, to allow a continuous evaluation.</b> Group work Continuous assessment Duration: 04:00</p>
10	<p><b>Chapter 4</b> Duration: 02:00 Lecture</p> <p><b>Chapter 5</b> Duration: 02:00 Lecture</p>			
11	<p><b>Chapter 5</b> Duration: 02:00 Lecture</p>	<p><b>Laboratory Exercise: Production and streaming of live audio-visual signal</b> Duration: 02:00 Laboratory assignments</p>		<p><b>Collaborative work. Presentation of the laboratory exercise memory in time, following the specified procedure, to allow a continuous evaluation.</b> Group work Continuous assessment Duration: 02:00</p>
12		<p><b>Laboratory Exercise: Production and streaming of live audio-visual signal</b> Duration: 04:00 Laboratory assignments</p>		<p><b>Collaborative work. Presentation of the laboratory exercise memory in time, following the specified procedure, to allow a continuous evaluation.</b> Group work Continuous assessment Duration: 04:00</p>

13		<b>Laboratory Exercise: Production and streaming of live audio-visual signal</b> Duration: 04:00 Laboratory assignments		<b>Collaborative work. Presentation of the laboratory exercise memory in time, following the specified procedure, to allow a continuous evaluation.</b> Group work Continuous assessment Duration: 04:00
14		<b>Laboratory Exercise: Production and streaming of live audio-visual signal</b> Duration: 04:00 Laboratory assignments		<b>Collaborative work. Presentation of the laboratory exercise memory in time, following the specified procedure, to allow a continuous evaluation.</b> Group work Continuous assessment Duration: 04:00
15				
16				
17				<b>Final exam (Chapters 1 to 5)</b> Written test Continuous assessment and final examination Duration: 02:00  <b>Collaborative work. Presentation of the laboratory exercise memory in time, following the specified procedure.</b> Group work Final examination Duration: 30:00

The independent study hours are training activities during which students should spend time on individual study or individual assignments.

Depending on the programme study plan, total values will be calculated according to the ECTS credit unit as 26/27 hours of student face-to-face contact and independent study time.

\* The subject schedule is based on a previous theoretical planning of the subject plan and might go through experience some unexpected changes along throughout the academic year.

## 7. Activities and assessment criteria

### 7.1. Assessment activities

#### 7.1.1. Continuous assessment

Week	Description	Modality	Type	Duration	Weight	Minimum grade	Evaluated skills
3	Collaborative work. Presentation of the laboratory exercise memory in time, following the specified procedure, to allow a continuous evaluation.	Group work	No Presential	04:00	5%	5 / 10	CE15 CG5 CT2 CT4 CT1 CG4 CT3 CE6 CG2 CE1 CT5
5	Collaborative work. Presentation of the laboratory exercise memory in time, following the specified procedure, to allow a continuous evaluation.	Group work	No Presential	04:00	5%	5 / 10	CE15 CG5 CT2 CT4 CT1 CG4 CE4 CT3 CE6 CG2 CE1 CT5
7	Collaborative work. Presentation of the laboratory exercise memory in time, following the specified procedure, to allow a continuous evaluation.	Group work	No Presential	04:00	5%	5 / 10	CE15 CG5 CT2 CT4 CT1 CG4 CE4 CT3 CE6 CG2 CE1 CT5

9	Collaborative work. Presentation of the laboratory exercise memory in time, following the specified procedure, to allow a continuous evaluation.	Group work	No Presential	04:00	5%	5 / 10	CG5 CT2 CT4 CT1 CE16 CG4 CE4 CT3 CE6 CG2 CE1 CT5 CE15
11	Collaborative work. Presentation of the laboratory exercise memory in time, following the specified procedure, to allow a continuous evaluation.	Group work	No Presential	02:00	5%	5 / 10	CE15 CG5 CT2 CT4 CT1 CE16 CG4 CE4 CT3 CE6 CG2 CE1 CT5
12	Collaborative work. Presentation of the laboratory exercise memory in time, following the specified procedure, to allow a continuous evaluation.	Group work	No Presential	04:00	5%	5 / 10	CG5 CT2 CT4 CT1 CE16 CG4 CE4 CT3 CE15 CE6 CG2 CE1 CT5
13	Collaborative work. Presentation of the laboratory exercise memory in time, following the specified procedure, to allow a continuous evaluation.	Group work	No Presential	04:00	10%	5 / 10	CT2 CT4 CT1 CE16 CG4 CE4 CE15 CG5 CT3 CE6 CG2 CE1 CT5

14	Collaborative work. Presentation of the laboratory exercise memory in time, following the specified procedure, to allow a continuous evaluation.	Group work	No Presential	04:00	10%	5 / 10	CE15 CG5 CT2 CT4 CT1 CE16 CG4 CE4 CT3 CE6 CG2 CE1 CT5
17	Final exam (Chapters 1 to 5)	Written test	Face-to-face	02:00	50%	5 / 10	CE15 CG5 CT2 CT4 CT1 CE16 CG4 CE4 CT3 CE6 CG2 CE1 CT5

### 7.1.2. Final examination

Week	Description	Modality	Type	Duration	Weight	Minimum grade	Evaluated skills
17	Final exam (Chapters 1 to 5)	Written test	Face-to-face	02:00	50%	5 / 10	CE15 CG5 CT2 CT4 CT1 CE16 CG4 CE4 CT3 CE6 CG2 CE1 CT5
17	Collaborative work. Presentation of the laboratory exercise memory in time, following the specified procedure.	Group work	Face-to-face	30:00	50%	5 / 10	CE15 CG5 CT2 CT4 CT1 CE16 CG4 CE4 CT3 CE6



## 7.2. Assessment criteria

Students will be qualified through continuous evaluation by default. According to the Normativa de Evaluación del Aprendizaje de la Universidad Politécnica de Madrid, students willing to renounce to continuous evaluation must deliver an instance in the general registry of the School Secretary to the coordinator before the end of the third week of the semester.

Evaluation will assess if students have acquired all the competences of the subject. Thus, evaluation through final assessment will be carried out considering all the evaluation techniques used in continuous evaluation (EX, ET, TG, etc.), and will be celebrated in the exam period approved by Junta de Escuela for the current academic semester and year. Evaluation activities that assess learning outcomes that cannot be evaluated through a single exam can be carried out along the semester.

Extraordinary examination will be carried out exclusively by the final assessment method.

The continuous evaluation of the student includes his/her attendance and active participation during the classes.

The activities carried out in the laboratory are related with the evaluation of learning outcomes which are difficult to assess in a final exam.

The laboratory evaluation is performed through the continuous monitoring of the activities done by the students, complemented with the memory descriptions of the work done submitted by the students. The submission of the memory descriptions in time, following the defined procedure, is a requirement to allow the proper continuous evaluation task.

The students may request to keep the obtained score of this part exclusively for the following year, according to the Rules for evaluation of subjects in the UPM, by delivering an instance in the general registry of the School Secretary to the coordinator before the end of the third week of the running semester.

Assistance to the laboratory and implementation of all the laboratory exercises is mandatory. 2 non-justified absences imply to fail in the laboratory exercises and, therefore, to fail the subject.

An exam will be done after week 15 to assess the competences acquired by the students from the theoretical lectures and the exercises done at the laboratory. The weight of this exam is 50% of the total score. The other 50% of the final score will be obtained from the work and the submitted memory descriptions of the laboratory exercises.



It is required to obtain a minimum of 3.5 points over 10 in each part (theory and laboratory, independently) to combine both weighted scores.

## 8. Teaching resources

### 8.1. Teaching resources for the subject

Name	Type	Notes
J. M. Menéndez y J. Casajús, "Tecnologías de audio y vídeo", Dto. Publicaciones E.T.S.I.T., 2006.	Bibliography	
J. Owens y G. Millerson, "Video Production Handbook", Focal Press, 15th Edition, 2012.	Bibliography	
B. Mendiburu, "3DTV and 3D Cinema", Focal Press, 2012.	Bibliography	
J. Owens y G. Millerson, "Television Production", Focal Press, 15th Edition, 2013.	Bibliography	
Xpertia Soluciones Integrales in collaboration with Cluster ICT-Audiovisual de Madrid, "Estado del Arte de las tecnologías audiovisuales. De la captación de imágenes al usuario final. Actualización 2013".	Bibliography	
Grupo Técnico del Foro de la Televisión de Alta Definición en España, "Cuestiones Técnicas relevantes aplicables a los distintos tipos de servicio". Abril de 2008	Bibliography	

J. M. Castillo, "Televisión, realización y lenguaje audiovisual". Instituto RTVE, 2ª edición, 2013.	Bibliography	
Web page of the subject <a href="http://moodle.upm.es/titulaciones/oficiales">http://moodle.upm.es/titulaciones/oficiales</a>	Web resource	
Laboratory of Signals and Communications A.202-L	Equipment	
Group work room: Laboratory A.202-L	Equipment	