

## Course guide

# 230210 - PAESAV - Advanced Project in Audiovisual Systems Engineering

Last modified: 16/06/2024

<b>Unit in charge:</b>	Barcelona School of Telecommunications Engineering	
<b>Teaching unit:</b>	739 - TSC - Department of Signal Theory and Communications.	
<b>Degree:</b>	BACHELOR'S DEGREE IN TELECOMMUNICATIONS TECHNOLOGIES AND SERVICES ENGINEERING (Syllabus 2015). (Optional subject).	
<b>Academic year:</b> 2024	<b>ECTS Credits:</b> 12.0	<b>Languages:</b> English

### LECTURER

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<b>Coordinating lecturer:</b>	ALBERT OLIVERAS VERGES
<b>Others:</b>	<p>Primer quadrimestre:</p> <p>ALBERTO AGUASCA SOLE - 11, 12, 13 EDUARDO JOSE ALARCON COT - 11, 12, 13 RAMON BRAGOS BARDIA - 11, 12, 13 JOSEP RAMON MORROS RUBIO - 12 ALBERT OLIVERAS VERGES - 11 JOSE ADRIAN RODRIGUEZ FONOLLOSA - 13 JAVIER RUIZ HIDALGO - 11 JOAN SARDA FERRER - 11, 12, 13 EVA MARIA VIDAL LOPEZ - 11, 12, 13</p> <p>Segon quadrimestre:</p> <p>ALBERTO AGUASCA SOLE - 41, 43 EDUARDO JOSE ALARCON COT - 41, 43 RAMON BRAGOS BARDIA - 41, 43 JOAN MANUEL GENE BERNAUS - 41 JOSE ANTONIO LAZARO VILLA - 41 BEATRIZ OTERO CALVIÑO - 43 JOSEP RAFEL PEGUEROLES VALLES - 43 JAVIER RUIZ HIDALGO - 41 JOAN SARDA FERRER - 41, 43 GLADYS MIRIAM UTRERA IGLESIAS - 43 EVA MARIA VIDAL LOPEZ - 41, 43</p>

### PRIOR SKILLS

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You must have passed Basic Engineering Project  
You must have passed Economics and Business

### REQUIREMENTS

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BASIC ENGINEERING PROJECT - Precorequisite  
ECONOMICS AND MANAGEMENT - Precorequisite



## DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

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### Generical:

11 CDIO N3. They will be able to apply a comprehensive view of the entire life cycle (conception, design, implementation and operation) of a product, process or service in the ICC field, and identify users' needs and develop a set of requirements for the product, process or service and a set of initial specifications. They will be able to explore possible solutions and select the best one. They will be able to carry out a design process following a standardised methodology. They will know how to evaluate and propose improvements to the design. They will take into account economic and social aspects of the project or product.

### Transversal:

1. ENTREPRENEURSHIP AND INNOVATION - Level 3. Using knowledge and strategic skills to set up and manage projects. Applying systemic solutions to complex problems. Devising and managing innovation in organizations.

2. SUSTAINABILITY AND SOCIAL COMMITMENT - Level 3. Taking social, economic and environmental factors into account in the application of solutions. Undertaking projects that tie in with human development and sustainability.

## TEACHING METHODOLOGY

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Directed activities

Lectures

Team work (autonomous learning)

Homework (individual autonomous learning)

oral presentation

Short answer tests (Control)

Long answer test (Final Exam)

## LEARNING OBJECTIVES OF THE SUBJECT

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The course aims to achieve a double impact:

1. Consolidation and extension of the content of previous or parallel courses
2. Acquisition of generic skills at an advanced level. The course deals with almost all generic skills, with emphasis on:
  - Teamwork, leadership
  - Oral and written communication
  - Communication in 3rd language (English)
  - Entrepreneurship and innovation
  - Sustainability and social commitment
  - Ability to conceive, design, implement and operate complex systems in the ICT field

Learning outcomes:

Depending on the subject and scope of the project presented in this course, the student achieves the following learning outcomes:

Is able to build, operate and manage telecom services and applications, specifically those related to audiovisual and multimedia applications, including transducers, analog and digital processing, encoding, transport, representation, processing, storage, reproduction, management and presentation of these services and applications.

Is familiar with the analysis, specification, design, implementation, operation and maintenance of TV equipment, head-ends and facilities, audio and video, both in fixed and mobile environments.

Is able of performing projects about facilities for the production and recording of audio and video signals.

Is able of performing acoustic engineering projects and acoustic insulation of rooms and public address systems. Is familiar with the specification, analysis and selection of electroacoustic transducers. Knows and manages measurement systems for the analysis and control of noise and vibration. Has ability to pursue studies in the field of environmental acoustics and knows the underwater acoustic systems.

Has ability to create, encode, manage, publish and distribute multimedia content, according to criteria of usability and accessibility of audiovisual systems for broadcasting and interactives.

Takes initiatives that create new opportunities and solutions with vision of implementation, process and market

Uses knowledge and strategic skills to create and manage projects with an innovative approach. Applies systemic solutions to complex problems.

Has the capacity to critically reflect on sustainability in the professional field and applies sustainability criteria and the deontological codes of the profession in the design and evaluation of technological solutions. Identifies the need to apply legislation, regulations and regulations. Considers environmental criteria in projects related to the professional field and includes indicators to estimate/measure the environmental impact. Considers in the projects and actions criteria of safety, health and social justice and includes indicators to measure its social impact.

Knows the concept of life cycle of a product and applies it to the development of ICT products and services, using the suitable regulations and legislation. Knows strategies and/or technologies for the reduction, reuse and recycling of natural resources and waste related to products and services in the corresponding professional field and knows how to use the suitable metrics (or tools) to measure their environmental impact throughout the life cycle (extraction, production, use and end of life).

Studies with books and articles in English and writes a report in English and participates in a technical meeting conducted in that language.

Conducts an oral presentation in English and answers questions from the audience.

Uses strategies to prepare and carry out oral and written texts and documents with consistent content, structure and style, appropriate level and good spelling and grammar.

Communicates clearly and effectively in oral and written presentations on complex subjects, adapting to the situation, to the audience and to the objectives of the communication.

Plans and reaches agreements on the objectives, operating rules, responsibilities, schedule and review procedures work.

Identifies the roles, skills and shortcomings of the different group members, recognizing and / or assuming the role of leader.

Negotiates and manages conflicts within the group.

Identifies user needs and develops a definition of product-process-service and its initial specifications. Follows the process management model based on a standard. Evaluates the application of laws and regulations that apply.

Identifies needs and market opportunities. Collects information that would allow elaborating specifications for a new product, process or service. Elaborates a basic business plan.

Is able to provide new ideas and solutions in a project of his/her professional field to make it more sustainable, to propose sustainable projects, to monitor and dismantle properly and to select which indicators will be used to measure sustainability.

Knows how to collaborate with social agents and the different stakeholders involved in a project in his/her professional field, to identify their needs and expectations, and to assess the implications they may have on the sustainability of the project

Learns about the concepts of social commitment and corporate social responsibility and their possibilities and limitations.



## STUDY LOAD

Type	Hours	Percentage
Hours small group	78,0	26.00
Hours large group	26,0	8.67
Self study	196,0	65.33

**Total learning time:** 300 h

## CONTENTS

### Lectures

**Description:**

Specific aspects of economics and business. Business plan.  
Regulations  
Contents related to the specific project

**Full-or-part-time:** 35h 20m

Theory classes: 15h 20m

Self study : 20h

### Seminars:

**Description:**

Critical thinking  
System thinking  
Research in specialized databases of business information  
Research in specialized databases of patents  
Patent preparation strategy  
Teamwork, leadership  
Sustainability: environmental, social and economic viability impact. Ethical issues.  
Advanced project management methodology

**Full-or-part-time:** 22h 30m

Theory classes: 10h

Self study : 12h 30m

## Project

### Description:

Project to develop a product or service with a high technical complexity, carried out by a large group of people (7-12) who divide the work into subgroups (3-4) and coordinate at different levels.

- Several different projects will be offered, most of them proposed by companies, hospitals, NGOs or other external institutions.
- Some strategic projects will be offered from the School.
- Some projects may be more suitable for one of the majors of the degree while others will be transversal or even require members of the different majors.
- The projects incorporate different parts (theoretical study, HW, SW, measurements, economic study, non-financial study of environmental, social and ethical impacts)

Examples of possible topics:

- Telemedicine: biomedical sensor + communications link + data analysis on a cloud server
- Payload of a picosatellite, mission control.
- Fleet management (GPS, communications, BBDD, cartography)
- AI-powered shopping assistant
- Monitoring system for endangered species
- Management of the network of an ICU and obtaining estimators with AI techniques.
- Optimization of trajectories of a mobile printing robot
- Participation in the Formula Student project.

**Full-or-part-time:** 234h 40m

Guided activities: 99h 10m

Self study : 135h 30m

## ACTIVITIES

### (ENG) Presentació oral

### (ENG) Proves de resposta curta (Control)

### (ENG) Proves de resposta llarga (Examen Final)

### Oral presentation

#### Description:

Final project presentation

**Full-or-part-time:** 0h 30m

Laboratory classes: 0h 30m



## GRADING SYSTEM

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- Continuous assessment of the activities carried out in the case studies of training sessions and seminars
- Continuous assessment, documentation and oral presentation of the project reports.
- Cross-assessment and co-assessment of the project

A global mark is assigned to the project developed by the team using a rubric that takes into account the different aspects of the process and its documentation (50%), and of the final result, the presentations that have been made and the final report (50%).

This mark is modulated for each component of the group with three coefficients, with a modulation rate of 30% each. One is determined from the evidences collected by the teaching staff in the in-person sessions, the other is determined by the team leader with the points-bag procedure and the other by the co-assessment carried out by all members of the team using a rubric. In the latter case, the team leader is evaluated for his or her role as a team leader.

This course will assess at least the following generic skills:

- Entrepreneurship and innovation (high)
- Sustainability and social commitment (high)
- Ability to conceive, design, implement and operate complex systems in the field of ICT (High Level)

## EXAMINATION RULES.

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A clear failure performing the tasks assigned by the team can mean the failure of the course regardless of the grade given to the group project