

## Course guide

# 230026 - TPA - Audiovisual Technology and Production

**Last modified:** 15/01/2024

**Unit in charge:** Barcelona School of Telecommunications Engineering  
**Teaching unit:** 710 - EEL - Department of Electronic Engineering.

**Degree:** BACHELOR'S DEGREE IN TELECOMMUNICATIONS TECHNOLOGIES AND SERVICES ENGINEERING (Syllabus 2015). (Optional subject).  
BACHELOR'S DEGREE IN DATA SCIENCE AND ENGINEERING (Syllabus 2017). (Optional subject).

**Academic year:** 2023    **ECTS Credits:** 6.0    **Languages:** Catalan, Spanish, English

### LECTURER

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**Coordinating lecturer:** Consultar aquí / See here:  
<https://telecos.upc.edu/ca/estudis/curs-actual/professorat-responsables-coordinadors/responsables-assignatura>

**Others:** Consultar aquí / See here:  
<https://telecos.upc.edu/ca/estudis/curs-actual/professorat-responsables-coordinadors/professorat-assignat-idioma>

### PRIOR SKILLS

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Knowledge of Audiovisual Signal Processing  
Fundamentals of Communications  
Acoustics & Electroacoustics

### REQUIREMENTS

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ACÚSTICA I ELECTROACÚSTICA - Corequisit

### DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

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**Transversal:**

06 URI N3. EFFECTIVE USE OF INFORMATION RESOURCES - Level 3. Planning and using the information necessary for an academic assignment (a final thesis, for example) based on a critical appraisal of the information resources used.

### TEACHING METHODOLOGY

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Theory sessions (3h/week) and lab sessions (2h/week).  
Group assignments and individual assignments, exercises, oral presentations.  
Tests, short answer and long answer questionnaires.  
AV production project (term project)

## LEARNING OBJECTIVES OF THE SUBJECT

The course covers basic technologies in audiovisual (AV) production from an engineering perspective. The basics of operation (operator view) in AV production scenarios are briefly introduced. The aim is acquainting students with production environments while acquiring skills for the design, installation, configuration and maintenance of production rooms and equipment (engineering view). The contents follow the signal path through the production chain, departing from technical design of sets –acoustics, lighting–, analyzing equipment and functions along the production path –sensors, channels, processing, recording, playback and monitoring– and ending up in AV display and monitoring.

## STUDY LOAD

Type	Hours	Percentage
Hours small group	26,0	17.33
Self study	85,0	56.67
Hours large group	39,0	26.00

**Total learning time:** 150 h

## CONTENTS

### 1. Introduction. Production Path

#### Description:

Introduction to the audiovisual (AV) production chain. The various elements composing the AV production chain are introduced by following the signal flow in production facilities.

#### Specific objectives:

- 1.1 Introduction to audiovisual production
- 1.2 Production path: audiovisual sources and processing equipment
- 1.3 Production scenarios: sets, audio and lighting

#### Related activities:

Lab1: Lab Introduction  
Lab2: LabMU Studio Introduction

#### Full-or-part-time: 17h

Theory classes: 3h  
Laboratory classes: 4h  
Self study : 10h

## 2. Acoustics and Lighting in Production Sets

### Description:

Audio recording, Physiological/Psychoacoustics, Studio Acoustics. Lighting: intro, equipment, measurement and safety

### Specific objectives:

- 2.1 Introduction to Acoustics. Physiological Acoustics and Psychoacoustics
- 2.2 Introduction to Audio Recording
- 2.3 Introduction to lighting
- 2.4 - 2.6 Basic elements of lighting. Lighting equipment.
- 2.7 - 2.9 Lighting equipment control. Gripology. Light measurement. Safety issues

### Related activities:

Lab 5: Sets and Lighting

### Full-or-part-time: 23h

Theory classes: 9h

Laboratory classes: 2h

Self study : 12h

## 3. AV Recording and Sensors

### Description:

Sensors in AV recording: audio sensors and video sensors. Microphones: types and configuration in studios. Cameras: types and studio configurations. Interaction among AV sensors.

### Specific objectives:

- 3.1 Introduction to cameras. Types of cameras
- 3.2 Camera sensors and camera lens
- 3.3 Cameras' operation and configuration
- 3.4 Acoustic design of recording studios
- 3.5 Audio Recording techniques
- 3.6 Studio monitors (loudspeakers)
- 3.7 Integral design of Recording Studios

### Related activities:

Lab 6: Recording & Sensors: Cameras

### Full-or-part-time: 17h

Theory classes: 5h

Laboratory classes: 2h

Self study : 10h

#### 4. Studio Signals

**Description:**

Review of main signals present in a production studio. Professional video and audio signals.

**Specific objectives:**

- 4.1 - 4.2 AV signal concepts
- 4.3 - 4.6 Video & Audio signals
- 4.7 Image and graphics

**Related activities:**

- Lab 7: AV Studio Signals: formats
- Lab 8: AV Studio Signals: graphics

**Full-or-part-time:** 26h

Theory classes: 7h

Laboratory classes: 4h

Self study : 15h

#### 5. Production Equipment and Processing

**Description:**

Studio processing stages and equipment.

**Specific objectives:**

- 5.1 Mixers and switching
- 5.2 - 5.3 Program scheduling. Control and monitoring
- 5.4 Recording and formats conversion
- 5.5 Graphics, effects, post-production
- 5.6 i 5.7 TV headers and TV production

**Related activities:**

- Lab 9: Studio rooms: sets, switching and mixers
- Lab 10: Studio rooms: scheduling and control

**Full-or-part-time:** 26h

Theory classes: 7h

Laboratory classes: 4h

Self study : 15h

#### 6. Audiovisual Display Systems

**Description:**

Audiovisual monitoring and display

**Specific objectives:**

- 6.1 - 6.3 Video monitors and displays

**Related activities:**

- Lab 11: Displays, Monitoring and Postproduction

**Full-or-part-time:** 16h

Theory classes: 4h

Laboratory classes: 2h

Self study : 10h

## 7. Audiovisual Production Scenarios

### Description:

Studio scenarios and new trends: tapeless production, digital convergence, 3D, format agnostic production...

### Specific objectives:

7.1 Production scenarios

7.2 New trends: convergence, tapeless, 3D video & audio, cinematic VR, format agnostic production

7.3 Studio visit (if available)

### Related activities:

Lab 12: Complete production path (I)

Lab 13: Complete production path (II)

### Full-or-part-time: 19h

Theory classes: 3h

Laboratory classes: 4h

Self study : 12h

## Term project

### Description:

AV Production project

### Specific objectives:

Produce a short clip working in a production team.

Steps to follow: idea selection, role assignment (producer, writer, director, cast, camera operators, assistants...), generate treatment, collaborative scriptwriting, planning (resources, schedule), production, postproduction and presentation

### Related activities:

Lab 3: Term Project preparation (I)

Lab 4: Term Project preparation (II)

### Full-or-part-time: 31h

Laboratory classes: 4h

Other activities: 15h

Assessment sessions: 2h

Self study : 10h

## GRADING SYSTEM

Control (CNT): 15%

Final exam (EX): 40%

Labs (LAB): 25% (attendance required + lab reports)

Term project (PROJ): 20%

ASSESSMENT = MAX( 0,15 CNT +0,40 EX +0,25 LAB +0,20 PROJ; 0,55 EX +0,25 LAB +0,20 PROJ ; 0,75 EX +0,25 LAB)

## BIBLIOGRAPHY

### Basic:

- Foust, J.C; Fink, E.J; Gross, L.S.. Video production: disciplines and techniques [on line]. 11th ed. Routledge: Holcomb Hathaway, 2017 Available on: <https://doi.org/10.4324/9781315168180>. ISBN 9781138051812.

- Alten, S.R. Audio in media. 9th ed. Belmont: Wadsworth/Thomson Learning, 2011. ISBN 053874362X.

- Poynton, C.A. Digital video and HD: algorithms and interfaces [on line]. 2nd ed. Waltham: Morgan Kaufman, 2012 [Consultation: 27/01/2015]. Available on: <http://site.ebrary.com/lib/upcatalunya/docDetail.action?docID=10537913>. ISBN 9780123919328.



**Complementary:**

- Brown, B. Motion picture and video lighting. 2nd ed. Boston: Focal Press (Elsevier), 2008. ISBN 9780240807638.
- Sauls, S.J.; Stark, C.A. Audio production worktext: concepts, techniques, and equipment. 10th ed. New York: Routledge, 2022. ISBN 9780367640361.
- Huber, D.M.; Runstein, R.E. Modern recording techniques [on line]. 7th ed. Burlington, MA: Focal Press, 2010 [Consultation: 08/04/2021]. Available on: <https://ebookcentral.proquest.com/lib/upcatalunya-ebooks/detail.action?docID=535005>. ISBN 9780080928036.

## RESOURCES

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**Other resources:**

Course slides, materials, links and previous exams available in Atenea.

Equipment of the AV Production Lab ETSETB/UPC: IP production environment LabMU, XDCam Sony PMW-.EX1 & EX-3, tripods, stabilizer & smooth shooter, lighting kit, Sennheiser 8355 microphones, Audiombox USB...