230026 - TPA - Audiovisual Technology and Production

Coordinating unit: 230 - ETSETB - Barcelona School of Telecommunications Engineering
Teaching unit: 710 - EEL - Department of Electronic Engineering
Academic year: 2019
Degree: BACHELOR'S DEGREE IN AUDIOVISUAL SYSTEMS ENGINEERING (Syllabus 2009). (Teaching unit Compulsory)
BACHELOR'S DEGREE IN TELECOMMUNICATIONS TECHNOLOGIES AND SERVICES ENGINEERING (Syllabus 2015). (Teaching unit Optional)
ECTS credits: 6 Teaching languages: Catalan, English

Teaching staff

Coordinator: - CASAS PLA, JOSEP R. (TSC)
Others: - CARRIÓN ISBERT, ANTONI (TSC)
- MIREYA FERNANDEZ CHIMENO

Prior skills

Audiovisual Signal Processing
Fundamentals of Communications
Acoustics & Electroacoustics

Requirements

INTRODUCTION TO AUDIOVISUAL SIGNAL PROCESSING - Prerequisite
INTRODUCTION TO COMMUNICATIONS - Prerequisite
ACOUSTICS & ELECTROACOUSTICS - Prerequisite

Degree competences to which the subject contributes

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

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 introducing students to 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.

<table>
<thead>
<tr>
<th>Study load</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total learning time:</strong> 150h</td>
</tr>
<tr>
<td>Hours large group: 39h 26.00%</td>
</tr>
<tr>
<td>Hours small group: 26h 17.33%</td>
</tr>
<tr>
<td>Self study: 85h 56.67%</td>
</tr>
</tbody>
</table>
### 1. Introduction. Production Path

**Learning time:** 17h  
- **Theory classes:** 3h  
- **Laboratory classes:** 4h  
- **Self study:** 10h

**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.

**Related activities:**  
Lab1: Lab Introduction  
Lab2: LabMU Studio Introduction

**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

### 2. Acoustics and Lighting in Production Sets

**Learning time:** 23h  
- **Theory classes:** 9h  
- **Laboratory classes:** 2h  
- **Self study:** 12h

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

**Related activities:**  
Lab 5: Sets and Lighting

**Specific objectives:**  
2.1 Introduction to Acoustics  
2.2 Introduction to Audio Recording  
2.3 Physiological Acoustics and Psychoacoustics  
2.4 & 2.6 Studio Acoustics: geometry, absorption, diffusion, isolation, noise & vibration control  
2.7 Introduction to lighting  
2.8 & 2.9 Basic elements of lighting. Lighting equipment.  
2.10 & 2.12 Lighting equipment control. Gripology. Light measurement. Safety issues
### 3. AV Recording and Sensors

<table>
<thead>
<tr>
<th>Learning time:</th>
<th>17h</th>
</tr>
</thead>
<tbody>
<tr>
<td>Theory classes:</td>
<td>5h</td>
</tr>
<tr>
<td>Laboratory classes:</td>
<td>2h</td>
</tr>
<tr>
<td>Self study:</td>
<td>10h</td>
</tr>
</tbody>
</table>

**Description:**

**Related activities:**
Lab 6: Recording & Sensors: Cameras

**Specific objectives:**
- 3.1 Studio microphones
- 3.2 Audio recording configuration: LEDE rooms, RFZ+diffusion rooms
- 3.3 Introduction to cameras
- 3.4 Camera sensors and camera lens
- 3.5 Types of cameras, Cameras’ operation and configuration

### 4. Studio Signals

<table>
<thead>
<tr>
<th>Learning time:</th>
<th>26h</th>
</tr>
</thead>
<tbody>
<tr>
<td>Theory classes:</td>
<td>7h</td>
</tr>
<tr>
<td>Laboratory classes:</td>
<td>4h</td>
</tr>
<tr>
<td>Self study:</td>
<td>15h</td>
</tr>
</tbody>
</table>

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

**Related activities:**
Lab 7: AV Studio Signals: formats
Lab 8: AV Studio Signals: graphics

**Specific objectives:**
- 4.1 4.2 AV signal concepts
- 4.3 4.6 Video & Audio signals
- 4.7 Image and graphics
### 5. Production Equipment and Processing

<table>
<thead>
<tr>
<th>Description:</th>
<th>Studio processing stages and equipment.</th>
</tr>
</thead>
</table>
| Related activities: | Lab 9: Studio rooms: sets, switching and mixers  
Lab 10: Studio rooms: scheduling and control |
| 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 - 5.7 TV headers and TV production |

**Learning time:** 26h  
Theory classes: 7h  
Laboratory classes: 4h  
Self study: 15h

### 6. Audiovisual Display Systems

<table>
<thead>
<tr>
<th>Description:</th>
<th>Audiovisual monitoring and display</th>
</tr>
</thead>
<tbody>
<tr>
<td>Related activities:</td>
<td>Lab 11: Displays, Monitoring and Postproduction</td>
</tr>
</tbody>
</table>
| Specific objectives: | 6.1 - 6.3 Video monitors and displays  
6.4 Studio monitors (loudspeakers) |

**Learning time:** 16h  
Theory classes: 4h  
Laboratory classes: 2h  
Self study: 10h
7. Audiovisual Production Scenarios

<table>
<thead>
<tr>
<th>Learning time: 19h</th>
</tr>
</thead>
<tbody>
<tr>
<td>Theory classes: 3h</td>
</tr>
<tr>
<td>Laboratory classes: 4h</td>
</tr>
<tr>
<td>Self study : 12h</td>
</tr>
</tbody>
</table>

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

**Related activities:**
- Lab 12: Complete production path (I)
- Lab 13: Complete production path (II)

**Specific objectives:**
- 7.1 Production scenarios
- 7.2 New trends: convergence, 3D video, 3D audio, format agnostic production
- 7.3 Studio visit

---

**Term project**

<table>
<thead>
<tr>
<th>Learning time: 31h</th>
</tr>
</thead>
<tbody>
<tr>
<td>Laboratory classes: 4h</td>
</tr>
<tr>
<td>Other activities: 15h</td>
</tr>
<tr>
<td>Assessment sessions: 2h</td>
</tr>
<tr>
<td>Self study : 10h</td>
</tr>
</tbody>
</table>

**Description:**
AV Production project

**Related activities:**
- Lab 3: Term Project preparation (I)
- Lab 4: Term Project preparation (II)

**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

---

**Qualification 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 ; 0,75 EX +0,25 LAB)
Bibliography

Basic:


Complementary:

