Course guide
230027 - CCAV - Audiovisual Coding

Unit in charge: Barcelona School of Telecommunications Engineering
Teaching unit: 739 - TSC - Department of Signal Theory and Communications.
Degree: BACHELOR'S DEGREE IN TELECOMMUNICATIONS TECHNOLOGIES AND SERVICES ENGINEERING (Syllabus 2015). (Optional subject).

Academic year: 2022  ECTS Credits: 6.0  Languages: Catalan, Spanish

LECTURER

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

REQUIREMENTS

AUDIO AND SPEECH PROCESSING - Precorequisite
IMAGE AND VIDEO PROCESSING - Precorequisite

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Generical: 12 CPE N3. They will be able to identify, formulate and solve engineering problems in the ICC field and will know how to develop a method for analysing and solving problems that is systematic, critical and creative.

TEACHING METHODOLOGY
LEARNING OBJECTIVES OF THE SUBJECT

The aim of this subject is twofold. First, the student is given the knowledge about the basic tools used in any audiovisual signal coding system, highlighting both the aspects related to the redundancy present in the signal (information theory) and the relevance of information to the end user (perception theory). Second, it studies how these tools are used in specific cases of current audiovisual standards and the conditions that have imposed these standards as well as the usefulness of each of them.

Learning outcome:

The student has the ability to build, operate and manage telecommunications services and applications, in particular those related to audiovisual services and multimedia applications, including capture systems, analog and digital processing, coding, transport, representation, processing, storage, reproduction, management and presentation of such services and applications.

The student is familiar with the analysis, specification, design, implementation, operation and maintenance of equipment, headers and installations for television, audio and video, both in fixed and mobile environments.

The student is able to carry out projects of premises and facilities for the production and recording of audio and video signals.

The student has the capacity to create, encode, manage, disseminate and distribute multimedia content, meeting the criteria of usability and accessibility of audiovisual, broadcasting and interactive services.

The student identifies and models complex systems. Carries out qualitative analyzes and approximations, establishing the uncertainty of the results. The student raises hypotheses and experimental methods to validate them. The student identifies key components and establishes commitments and priorities.

The student applies the skills acquired to carry out a task autonomously. The student identifies the need for lifelong learning and develops his/her own strategy for doing so.

STUDY LOAD

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<tr>
<th>Type</th>
<th>Hours</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Hours large group</td>
<td>52.0</td>
<td>34.67</td>
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<tr>
<td>Hours small group</td>
<td>13.0</td>
<td>8.67</td>
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<tr>
<td>Self study</td>
<td>85.0</td>
<td>56.67</td>
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Total learning time: 150 h

CONTENTS

(ENG) Topic 1. Introduction and Basic Principles of Coding

Description:
Transformed and predictived methods. Quantization. Entropy coding.

Laboratories: Introduction

Full-or-part-time: 6h
Theory classes: 2h
Laboratory classes: 2h
Self study: 2h
### (ENG) Tema 2. Codificació entròpica

**Description:**
Entropy coding: scalar and vector Huffman codes  
Aplication: Group 3, Group 4  
Entropy coding: Arithmetic coding  
Aplication: JBIG

Laboratory: Entropy coding

**Specific objectives:**

**Full-or-part-time:** 14h  
Theory classes: 6h  
Laboratory classes: 2h  
Self study: 6h

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### (ENG) Tema 3. Codificació de veu

**Description:**

**Full-or-part-time:** 26h  
Theory classes: 12h  
Laboratory classes: 2h  
Self study: 12h

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### (ENG) Tema 4. Codificació d’àudio

**Description:**

**Full-or-part-time:** 22h  
Theory classes: 10h  
Laboratory classes: 2h  
Self study: 10h

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### (ENG) Tema 5. Codificació d’imatge

**Description:**

**Full-or-part-time:** 18h  
Theory classes: 8h  
Laboratory classes: 2h  
Self study: 8h

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### (ENG) Tema 6. Codificació de vídeo

**Description:**

**Full-or-part-time:** 22h  
Theory classes: 10h  
Laboratory classes: 2h  
Self study: 10h
## ACTIVITIES

<table>
<thead>
<tr>
<th>ACTIVITY</th>
<th>Full-or-part-time</th>
<th>Laboratory classes</th>
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<tbody>
<tr>
<td>(ENG) Pràctica de laboratori</td>
<td>2h</td>
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<tr>
<td>(ENG) Proves de resposta llarga (Examen Final)</td>
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</tr>
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</table>

## GRADING SYSTEM

## EXAMINATION RULES.

## BIBLIOGRAPHY

**Basic:**

**Complementary:**
- Taubman, D.S.; Marcellin, M.W. JPEG2000: image compression fundamentals, standards and practice. Boston; Dordrecht; London: