Course guide
230204 - DRCAV - Description and Retrieval of Audiovisual Content

Unit in charge: Barcelona School of Telecommunications Engineering
Teaching unit: 739 - TSC - Department of Signal Theory and Communications.
701 - DAC - Department of Computer Architecture.

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: 2022  ECTS Credits: 6.0  Languages: English

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

PRIOR SKILLS
Knowledge of processing of audio and video signals. Good programming skills.

REQUIREMENTS

AUDIOVISUAL CODING - Precorequisite

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Transversal:
1. SELF-DIRECTED LEARNING - Level 3. Applying the knowledge gained in completing a task according to its relevance and importance. Deciding how to carry out a task, the amount of time to be devoted to it and the most suitable information sources.

TEACHING METHODOLOGY

Theory + application classes: Development of concepts from examples and problems.
Laboratory classes: Development of practices based on a case to solve, using existing resources. Analysis of specific problems.

LEARNING OBJECTIVES OF THE SUBJECT

Provide the necessary tools to analyze and describe audiovisual content, and for developing systems for storage and retrieval of audiovisual content.
### STUDY LOAD

<table>
<thead>
<tr>
<th>Type</th>
<th>Hours</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hours small group</td>
<td>13.0</td>
<td>8.67</td>
</tr>
<tr>
<td>Self study</td>
<td>98.0</td>
<td>65.33</td>
</tr>
<tr>
<td>Hours large group</td>
<td>39.0</td>
<td>26.00</td>
</tr>
</tbody>
</table>

**Total learning time:** 150 h

### CONTENTS

#### Audiovisual databases

**Description:**
- Data and information retrieval: Structured vs. non-structured information; textual vs. audiovisual non-structured information.
- Data modelling, relational databases, XML and the Semantic Web.
- Non-SQL databases, scalable data storage and processing, big data.

**Full-or-part-time:** 16h  
Theory classes: 6h  
Laboratory classes: 10h

#### High-level description of audiovisual content

**Description:**
- Multimedia metadata, high-level vs. low-level description of audiovisual content.
- Multimedia metadata modeling, serialization and embedding (EXIF, MPEG-7, ontologies, etc.).

**Full-or-part-time:** 8h  
Theory classes: 6h  
Laboratory classes: 2h

#### Low-level description of audiovisual content

**Description:**
- Low-level descriptors of audiovisual content. Standards: MPEG7 and other.
- Extraction of low-level audio descriptors (pitch, timbre, rhythm, etc.).
- Extraction of low-level descriptors of image (color, shape, texture, etc.) and video (motion, localization, etc.).

**Full-or-part-time:** 8h  
Theory classes: 4h  
Laboratory classes: 4h
Retrieval and classification of audiovisual content

Description:
- Application to music information retrieval: fingerprinting, melody extraction, chord recognition, genre classification, etc.
- Application to face detection, recognition, verification, video retrieval, etc.

Full-or-part-time: 16h
Theory classes: 8h
Laboratory classes: 8h

GRADING SYSTEM

- Evaluation of part 1 (50%, topics 1 and 2):
  - Attendance and participation 10%
  - Laboratory assignments 20%
  - Project assignment 70%
- Evaluation of part 2:
  - Audio part (25%, topics 3 and 4):
    - Attendance and participation 10%
    - Laboratory assignments 20%
    - Project assignment 70%
  - Video part (25%, topics 3 and 4):
    - Attendance and participation 10%
    - Laboratory assignments 30%
    - Project assignment 60%

EXAMINATION RULES.

BIBLIOGRAPHY

Basic: