Course guides
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 AUDIOVISUAL SYSTEMS ENGINEERING (Syllabus 2009). (Optional subject).
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: 2021 ECTS Credits: 6.0 Languages: English

LECTURER
Coordinating lecturer: RUBEN TOUS LIESA
Others: RUBEN TOUS LIESA CLIMENT NADEU CAMPRUBI MONTSE PARDAS FELIU

PRIOR SKILLS
Basic knowledge of programming, along with processing and coding of audio and video signals.

REQUIREMENTS
Second year.

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>
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<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>
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</tbody>
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**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: