230624 - BIOM - Biometrics

Coordinating unit: 230 - ETSETB - Barcelona School of Telecommunications Engineering
Teaching unit: 739 - TSC - Department of Signal Theory and Communications
Academic year: 2019
Degree: MASTER’S DEGREE IN ADVANCED TELECOMMUNICATION TECHNOLOGIES (Syllabus 2019). (Teaching unit Optional)
MASTER’S DEGREE IN TELECOMMUNICATIONS ENGINEERING (Syllabus 2013). (Teaching unit Optional)
MASTER’S DEGREE IN INFORMATION AND COMMUNICATION TECHNOLOGIES (Syllabus 2009). (Teaching unit Optional)
ECTS credits: 5 Teaching languages: English

Teaching staff
Coordinator: JAVIER HERNANDO
Others: Sayrol Clols, Elisa

Degree competences to which the subject contributes

Specific:
1. Ability to apply information theory methods, adaptive modulation and channel coding, as well as advanced techniques of digital signal processing to communication and audiovisual systems.

Transversal:
2. EFFECTIVE USE OF INFORMATION RESOURCES: Managing the acquisition, structuring, analysis and display of data and information in the chosen area of specialisation and critically assessing the results obtained.
3. FOREIGN LANGUAGE: Achieving a level of spoken and written proficiency in a foreign language, preferably English, that meets the needs of the profession and the labour market.

Teaching methodology
- Lectures
- Individual work (distance)
- Oral presentations
- Extended answer tests

Learning objectives of the subject

In this course principles and methods of biometric systems will be presented to the student. The course will also cover the state-of-the-art techniques in audio, image and video technologies, including Deep Learning
## Study load

<table>
<thead>
<tr>
<th>Total learning time: 125h</th>
<th>Hours large group: 39h</th>
<th>31.20%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self study:</td>
<td>86h</td>
<td>68.80%</td>
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</table>
## 1. Introduction

**Learning time:** 4h  
Theory classes: 2h  
Self study: 2h

**Description:**  
- Definitions, examples, applications

## 2. System Architecture and Assessment

**Learning time:** 9h  
Theory classes: 3h  
Self study: 6h

**Description:**  
- System architecture: features, classifiers  
- Performance criteria

## 3. Face recognition

**Learning time:** 18h  
Theory classes: 6h  
Self study: 12h

**Description:**  
- Face detection  
- Face recognition

## 4. Fingerprint recognition

**Learning time:** 9h  
Theory classes: 3h  
Self study: 6h

**Description:**

## 5. Iris recognition

**Learning time:** 9h  
Theory classes: 3h  
Self study: 6h

**Description:**
### 6. Speaker recognition

**Description:**
- Identification and verification
- Diarization

**Learning time:** 18h  
Theory classes: 6h  
Self study: 12h

### 7. Other biometrics

**Description:**
- Signature
- Hand geometry
- Keystroke
- Others

**Learning time:** 44h 40m  
Theory classes: 8h 40m  
Self study: 36h

### 8. Multimodal biometrics

**Description:**
- Fusion levels
- Normalization and fusion

**Learning time:** 8h  
Theory classes: 2h  
Self study: 6h
### Planning of activities

<table>
<thead>
<tr>
<th>Activity</th>
<th>Hours</th>
<th>Theory classes</th>
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</thead>
<tbody>
<tr>
<td>Partial control</td>
<td>2h</td>
<td>2h</td>
</tr>
<tr>
<td>Oral presentation of individual work</td>
<td>0h 20m</td>
<td>0h 20m</td>
</tr>
<tr>
<td>Final exam</td>
<td>3h</td>
<td>3h</td>
</tr>
</tbody>
</table>

**Description:**
Final examination.

### Qualification system

Final examination: 40%
Partial examination: 20%
Individual work and oral presentation: 40%

### Bibliography

**Basic:**

**Complementary:**