Course guide
230383 - ACEND - Alternative Computing Strategies with Emerging Nanoelectronic Devices

Unit in charge: Barcelona School of Telecommunications Engineering
Teaching unit: 710 - EEL - Department of Electronic Engineering.
Degree: MASTER'S DEGREE IN TELECOMMUNICATIONS ENGINEERING (Syllabus 2013). (Optional subject).
MASTER'S DEGREE IN ADVANCED TELECOMMUNICATION TECHNOLOGIES (Syllabus 2019). (Optional subject).
MASTER'S DEGREE IN ELECTRONIC ENGINEERING (Syllabus 2022). (Optional subject).
Academic year: 2022  ECTS Credits: 3.0  Languages: English

LECTURER
Coordinating lecturer: Rubio Sola, Jose Antonio
Others: Rubio Sola, Jose Antonio

PRIOR SKILLS

TEACHING METHODOLOGY
Theory lectures, research works, lab experiments

LEARNING OBJECTIVES OF THE SUBJECT

STUDY LOAD

<table>
<thead>
<tr>
<th>Type</th>
<th>Hours</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hours small group</td>
<td>8.0</td>
<td>10.67</td>
</tr>
<tr>
<td>Hours large group</td>
<td>16.0</td>
<td>21.33</td>
</tr>
<tr>
<td>Self study</td>
<td>51.0</td>
<td>68.00</td>
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</tbody>
</table>

Total learning time: 75 h
# CONTENTS

## Memristive Devices, Circuits, and Systems

**Description:**
- Classes of Memory Resistors
- Theory of Memristors
- Nonlinear Dynamics of Memristors
- Application of Memristors

**Specific objectives:**
- Introduction to memristive circuits

**Related activities:**
- Class

**Full-or-part-time:** 10h
- Theory classes: 10h

## Signal Processing Paradigms Enabled by Disruptive Memristive Nanotechnologies

**Description:**
- Neuromorphic Computing
- Crosspoint Crossbar Computing
- Neural Network Computing
- Quantum Computing

**Specific objectives:**
- New circuits paradigms

**Related activities:**
- Class

**Full-or-part-time:** 10h
- Theory classes: 10h

## Laboratory

**Description:**
- Laboratory

**Specific objectives:**
- Experiments and simulation with Memristors

**Related activities:**
- Lab

**Full-or-part-time:** 4h
- Laboratory classes: 4h

### GRADING SYSTEM

Final exam 50%
Continuous evaluation 50%
EXAMINATION RULES.

Written/Oral/lab

BIBLIOGRAPHY

Basic:

RESOURCES

Audiovisual material:
- Slides of the professor. Slides of the professor

Computer material:
- Simulator, memristor models. Simulator, memristor models