Course guide
230115 - EI - Smart Electronics

Unit in charge: Barcelona School of Telecommunications Engineering
Teaching unit: 710 - EEL - Department of Electronic Engineering.

Degree: BACHELOR’S DEGREE IN TELECOMMUNICATIONS TECHNOLOGIES AND SERVICES ENGINEERING (Syllabus 2015). (Optional subject).
BACHELOR’S DEGREE IN ELECTRONIC ENGINEERING AND TELECOMMUNICATION (Syllabus 2018). (Optional subject).

Academic year: 2022  ECTS Credits: 6.0  Languages: Catalan, Spanish, 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
Basic knowledge in electronics, programming, signal processing, probability and statistics.

TEACHING METHODOLOGY
- Lectures.
- Hands-on seminars.
- Individual work (non-face-to-face).
- Short answer tests.
- Exercises.

LEARNING OBJECTIVES OF THE SUBJECT
This introductory and practical course aims to provide the elements necessary to design intelligent electronic systems that, due to various adaptation and control mechanisms, have the ability to learn and generalize the problems of engineering to be solved. Additionally, the use of the mentioned elements in various applications will be illustrated with the help of a series of case studies. The methodology of the course is based on active and PBL techniques so that students can apply and integrate these elements to solve a problem (based on one of the studied cases) through a customized design of an electronic system.

STUDY LOAD

<table>
<thead>
<tr>
<th>Type</th>
<th>Hours</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hours large group</td>
<td>26,0</td>
<td>17.33</td>
</tr>
<tr>
<td>Self study</td>
<td>98,0</td>
<td>65.33</td>
</tr>
<tr>
<td>Hours small group</td>
<td>26,0</td>
<td>17.33</td>
</tr>
</tbody>
</table>

Total learning time: 150 h
# CONTENTS

## (ENG) 1. Introducció al sistemes electrònics intel·ligents

**Description:**

**Full-or-part-time:** 46h
- Theory classes: 4h
- Practical classes: 4h
- Laboratory classes: 8h
- Self study: 30h

## (ENG) 2. Aplicacions dels sistemes electrònics intel·ligents

**Description:**
Presentation of several practical cases in environmental, biological, medical and home automation applications. Study of the application to video games.

**Full-or-part-time:** 58h
- Theory classes: 5h
- Practical classes: 5h
- Laboratory classes: 10h
- Self study: 38h

## (ENG) 3. Disseny de sistemes electrònics intel·ligents

**Description:**
Fundamentals and elements of smart electronic systems. Basic machine learning mechanisms needed for smart electronics.

**Full-or-part-time:** 46h
- Theory classes: 4h
- Practical classes: 4h
- Laboratory classes: 8h
- Self study: 30h

# ACTIVITIES

## (ENG) THEORETICAL WORK

**Description:**
Tests of true / false questions carried out on the teaching intranet and other activities related to the theoretical part.

**Full-or-part-time:** 12h
Self study: 12h
**(ENG) EXERCISIS**

**Description:**
Resolution of a series of deliverables.

**Full-or-part-time:** 24h
- Theory classes: 4h
- Laboratory classes: 4h
- Self study: 16h

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**(ENG) PRACTICAL WORK**

**Description:**
Design and testing of a smart electronic system.

**Full-or-part-time:** 34h
- Theory classes: 6h
- Laboratory classes: 6h
- Self study: 22h

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**GRADING SYSTEM**

The final mark of the course will be obtained from the grade of continuous assessment according to the following criteria:

- Theoretical work: 20%
- Exercises: 30%
- Practical work: 50%

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**BIBLIOGRAPHY**

**Basic:**

**Complementary:**

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**RESOURCES**

**Other resources:**
Class notes and other multimedia material available on the course intranet.