270504 - SEU - Embedded and Ubiquous Systems

Coordinating unit: 270 - FIB - Barcelona School of Informatics
Teaching unit: 707 - ESAII - Department of Automatic Control
Academic year: 2018
Degree: MASTER'S DEGREE IN INFORMATICS ENGINEERING (Syllabus 2012). (Teaching unit Compulsory)
ECTS credits: 6 Teaching languages: Catalan

Degree competences to which the subject contributes

Basic:
CB6. Ability to apply the acquired knowledge and capacity for solving problems in new or unknown environments within broader (or multidisciplinary) contexts related to their area of study.

Specific:
CTE8. Capability to design and develop systems, applications and services in embedded and ubiquitous systems.
CTE1. Capability to model, design, define the architecture, implement, manage, operate, administrate and maintain applications, networks, systems, services and computer contents.

General:
CG1. Capability to plan, calculate and design products, processes and facilities in all areas of Computer Science.
CG2. Capacity for management of products and installations of computer systems, complying with current legislation and ensuring the quality of service.
CG7. Capacity for implementation, direction and management of computer manufacturing processes, with guarantee of safety for people and assets, the final quality of the products and their homologation.
CG8. Capability to apply the acquired knowledge and to solve problems in new or unfamiliar environments inside broad and multidisciplinary contexts, being able to integrate this knowledge.
CG6. Capacity for general management, technical management and research projects management, development and innovation in companies and technology centers in the area of Computer Science.

Transversal:
CTR2. SUSTAINABILITY AND SOCIAL COMMITMENT: Capability to know and understand the complexity of the typical economic and social phenomena of the welfare society. Capacity for being able to analyze and assess the social and environmental impact.
CTR5. APPROPRIATE ATTITUDE TOWARDS WORK: Capability to be motivated by professional achievement and to face new challenges, to have a broad vision of the possibilities of a career in the field of informatics engineering. Capability to be motivated by quality and continuous improvement, and to act strictly on professional development. Capability to adapt to technological or organizational changes. Capacity for working in absence of information and/or with time and/or resources constraints.

Teaching methodology
Teaching methodology is described in Activities

Learning objectives of the subject

1. null
## Study load

<table>
<thead>
<tr>
<th>Total learning time: 150h</th>
<th>Theory classes:</th>
<th>25h</th>
<th>16.67%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Practical classes:</td>
<td>0h</td>
<td>0.00%</td>
</tr>
<tr>
<td></td>
<td>Laboratory classes:</td>
<td>25h</td>
<td>16.67%</td>
</tr>
<tr>
<td></td>
<td>Guided activities:</td>
<td>4h</td>
<td>2.67%</td>
</tr>
<tr>
<td></td>
<td>Self study:</td>
<td>96h</td>
<td>64.00%</td>
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</table>
### (ENG) Introducció

**Degree competences to which the content contributes:**

**Description:**
(ENG) Que és un sistema encastat? Esquema general d'un sistema encastat i distribuït. Conceptes bàsics.

Fiabilitat i Seguretat.

Abast. Aplicacions.

**Related activities:**
(ENG)

**Specific objectives:**

### (ENG) Plataformes hardware per a sistemes encastats

**Degree competences to which the content contributes:**

**Description:**
(ENG) Alternatives. Arquitectures, exemples d'aplicació.

Busos i interfícies.

Dispositius d'E/S. Sensors i actuadors.

Instrumentació i adquisició de dades.

**Related activities:**
(ENG)

**Specific objectives:**

### (ENG) Disseny i desenvolupament de sistemes encastats

**Degree competences to which the content contributes:**

**Description:**
(ENG) Requeriments funcionals d'un sistema.

Disseny conscient de l'arquitectura.

Co-disseny hardware-software.

Eines d'emulació i desenvolupament.

**Related activities:**
(ENG)

**Specific objectives:**
### (ENG) Sistemes operatius per sistemes encastats

**Degree competences to which the content contributes:**

**Description:**

(ENG) Requeriments: compacitat, eficiència i fiabilitat.


Sistemes operatius en temps real.

**Related activities:**

(ENG)

**Specific objectives:**

### (ENG) Sistemes ubics i mòbils

**Degree competences to which the content contributes:**

**Description:**

(ENG) Interconnexió de dispositius. Topologies.

Xarxes per sistemes encastats.

Intel·ligència ambiental (ambient intelligence).

Exemples d'aplicació: automoció, domòtica, seguretat, robòtica, agricultura, ...

**Related activities:**

(ENG)

**Specific objectives:**

### (ENG) Avaluació dels sistemes encastats

**Degree competences to which the content contributes:**

**Description:**

(ENG) Fiabilitat i tolerància a fallades.

Seguretat: estàndards de seguretat (SIL).

Eficiència.

**Related activities:**

(ENG)

**Specific objectives:**
## Planning of activities

| (ENG) Desenvolupament del tema 1 de l'assignatura | Hours: 8h  
Theory classes: 3h  
Practical classes: 0h  
Laboratory classes: 2h  
Guided activities: 0h  
Self study: 3h |
|-------------------------------------------------|-----------------------------------------------|
| **Description:**  
(ENG) | **Support materials:**  
(ENG) |
| **Descriptions of the assignments due and their relation to the assessment:**  
(ENG) | **Specific objectives:**  
(ENG) 1 |

| (ENG) Desenvolupament del tema 2 de l'assignatura | Hours: 15h  
Theory classes: 3h  
Practical classes: 0h  
Laboratory classes: 6h  
Guided activities: 0h  
Self study: 6h |
|-------------------------------------------------|-----------------------------------------------|
| **Description:**  
(ENG) | **Support materials:**  
(ENG) |
| **Descriptions of the assignments due and their relation to the assessment:**  
(ENG) | **Specific objectives:**  
(ENG) 1 |

| (ENG) Desenvolupament del tema 3 de l'assignatura | Hours: 16h  
Theory classes: 4h  
Practical classes: 0h  
Laboratory classes: 6h  
Guided activities: 0h  
Self study: 6h |
|-------------------------------------------------|-----------------------------------------------|
| **Description:**  
(ENG) | **Support materials:**  
(ENG) |
| **Descriptions of the assignments due and their relation to the assessment:**  
(ENG) | **Specific objectives:**  
(ENG) 1 |
### Descriptions of the assignments due and their relation to the assessment:

**Specific objectives:**

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<th>(ENG) Desenvolupament del tema 4 de l'assignatura</th>
<th><strong>Hours:</strong> 15h</th>
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</thead>
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<td>Description:</td>
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<tr>
<td></td>
<td>Practical classes: 0h</td>
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<td></td>
<td>Laboratory classes: 6h</td>
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<td></td>
<td>Guided activities: 0h</td>
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<td>Self study: 6h</td>
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<thead>
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<th>(ENG) Desenvolupament del tema 5 de l'assignatura</th>
<th><strong>Hours:</strong> 14h</th>
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<tr>
<td></td>
<td>Practical classes: 0h</td>
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<td>Laboratory classes: 5h</td>
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<td></td>
<td>Guided activities: 0h</td>
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<td>Self study: 6h</td>
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**Support materials:**

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</table>
## Desenvolupament del tema 6 de l'assignatura

**Description:**
(ENG)

**Support materials:**
(ENG)

**Descriptions of the assignments due and their relation to the assessment:**
(ENG)

**Specific objectives:**
(ENG) 1

### Hours:
9h
- Theory classes: 3h
- Practical classes: 0h
- Laboratory classes: 0h
- Guided activities: 0h
- Self study: 6h

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## Primer parcial

**Description:**
(ENG)

**Support materials:**
(ENG)

**Descriptions of the assignments due and their relation to the assessment:**
(ENG)

**Specific objectives:**
(ENG) 1

### Hours:
12h
- Guided activities: 2h
- Self study: 10h

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## Tercer parcial

**Description:**
(ENG)

**Support materials:**
(ENG)

**Descriptions of the assignments due and their relation to the assessment:**
(ENG)

**Specific objectives:**
(ENG)

### Hours:
12h
- Guided activities: 2h
- Self study: 10h
<table>
<thead>
<tr>
<th>Assignment</th>
<th>Description</th>
<th>Hours</th>
<th>Support materials</th>
<th>Description of Assignments Due and Their Relation to Assessment</th>
<th>Specific Objectives</th>
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<tr>
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<tr>
<td>Proposta Treball Dirigit (P1)</td>
<td>(ENG)</td>
<td>6h 18m</td>
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<td>Pre-projecte Treball Dirigit (P2)</td>
<td>(ENG)</td>
<td>10h 42m</td>
<td>(ENG)</td>
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Specific objectives:

(ENG)

(ENG) Defensa Projecte Treball Dirigit (P3)

Hours: 12h 42m
Theory classes: 0h
Practical classes: 0h
Laboratory classes: 0h
Guided activities: 2h
Self study: 10h 42m

Description:

(ENG)

Support materials:

(ENG)

Descriptions of the assignments due and their relation to the assessment:

(ENG)

Specific objectives:

(ENG)

Qualification system

Not yet translated

Bibliography

Basic: