Course guide
330117 - PBNAIM - Low-Level Programming: Industrial Applications of Microcontrollers

Unit in charge: Manresa School of Engineering
Teaching unit: 750 - EMIT - Department of Mining, Industrial and ICT Engineering.
Degree: BACHELOR’S DEGREE IN INDUSTRIAL ELECTRONICS AND AUTOMATIC CONTROL ENGINEERING (Syllabus 2009). (Optional subject).
Academic year: 2023
ECTS Credits: 6.0
Languages: Catalan

LECTURER
Coordinating lecturer: JESÚS VICENTE RODRIGO
Others: VICTOR BARCONS XIXONS

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:
1. The ability to specify, analyze, design, evaluate and document systems based on microcontrollers, as well as their implementation alternatives in industrial applications.
2. The ability to use microcomputer tools and programming languages.
3. The knowledge and ability to use existing tools and instrumentation for the analysis, design, development and verification of electronic, computer and communications systems.
4. Understand and use the principles and their application in low-level programming, operating systems and communication systems.

Transversal:
6. EFFICIENT ORAL AND WRITTEN COMMUNICATION - Level 3. Communicating clearly and efficiently in oral and written presentations. Adapting to audiences and communication aims by using suitable strategies and means.
7. 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

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>30,0</td>
<td>20.00</td>
</tr>
<tr>
<td>Hours large group</td>
<td>30,0</td>
<td>20.00</td>
</tr>
<tr>
<td>Self study</td>
<td>90,0</td>
<td>60.00</td>
</tr>
</tbody>
</table>

Total learning time: 150 h
## CONTENTS

### (ENG) 1. INTRODUCCIÓ

- **Full-or-part-time:** 8h
- Theory classes: 4h
- Self study: 4h

### (ENG) 2. ARQUITECTURES DE MICROCONTROLADORS

- **Full-or-part-time:** 12h
- Theory classes: 6h
- Self study: 6h

### (ENG) 3. PROGRAMACIÓ A BAIX NIVELL

- **Full-or-part-time:** 50h
- Theory classes: 10h
- Practical classes: 10h
- Self study: 30h

### (ENG) 4. IMPLEMENTACIÓ D'APLICACIONS INDUSTRIALS

- **Full-or-part-time:** 80h
- Theory classes: 10h
- Practical classes: 20h
- Self study: 50h

## ACTIVITIES

### (ENG) 1. CLASSE EXPOSITIVA I DE PROBLEMES

- **Full-or-part-time:** 26h
  - Theory classes: 26h

### (ENG) 2. CLASSE DE LABORATORI

- **Full-or-part-time:** 60h
  - Laboratory classes: 30h
  - Self study: 30h

### (ENG) 3. TREBALL PERSONAL INDIVIDUAL/EN GRUP

- **Full-or-part-time:** 30h
  - Self study: 30h
(ENG) 4. PROVES

Full-or-part-time: 34h
Theory classes: 4h
Self study: 30h

GRADING SYSTEM

BIBLIOGRAPHY

Basic:
- Manuals de referència i Notes d'aplicació del fabricant (en anglès).