Degree competences to which the subject contributes

Specific:
3. Apply their knowledge to industrial informatics and communications.

Transversal:
1. TEAMWORK - Level 3. Managing and making work groups effective. Resolving possible conflicts, valuing working with others, assessing the effectiveness of a team and presenting the final results.

Teaching methodology
The course uses the methodology of exhibitions in 28% (theoretical and laboratory sessions), monitoring of activities aimed at 12%, individual in 17.3%, the project-based learning by 40% evaluation sessions and 2.7%.

Learning objectives of the subject
1. Introduce students to basic concepts of microcontrollers, its architecture, its programming and the connection with the elements of their environment.
2. Acquire skills to design, deploy and implement electronic systems based on microcontrollers.
# Study load

<table>
<thead>
<tr>
<th>Total learning time: 150h</th>
<th>Hours large group: 45h</th>
<th>30.00%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Hours medium group: 0h</td>
<td>0.00%</td>
</tr>
<tr>
<td></td>
<td>Hours small group: 15h</td>
<td>10.00%</td>
</tr>
<tr>
<td></td>
<td>Guided activities: 0h</td>
<td>0.00%</td>
</tr>
<tr>
<td></td>
<td>Self study: 90h</td>
<td>60.00%</td>
</tr>
</tbody>
</table>
## Content

<table>
<thead>
<tr>
<th>(ENG) -Tema 1: Introducció a la Informàtica Industrial</th>
<th>Learning time: 14h</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Theory classes: 4h</td>
</tr>
<tr>
<td></td>
<td>Self study: 10h</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>(ENG) -Tema 2: Manipulació de la informació</th>
<th>Learning time: 16h</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Theory classes: 4h</td>
</tr>
<tr>
<td></td>
<td>Laboratory classes: 2h</td>
</tr>
<tr>
<td></td>
<td>Self study: 10h</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>(ENG) -Tema 3: Control de perifèrics en llenguatge ensamblador.</th>
<th>Learning time: 16h</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Theory classes: 4h</td>
</tr>
<tr>
<td></td>
<td>Laboratory classes: 2h</td>
</tr>
<tr>
<td></td>
<td>Self study: 10h</td>
</tr>
</tbody>
</table>

### Description:
(ENG) Control de teclats matricials.  
Tècnica de consulta ("polling").  
Control de visualitzadors de 7 segments.

### Specific objectives:
(ENG) Distingir la funcionalitat dels terminals de connexió d'un mC.

<table>
<thead>
<tr>
<th>(ENG) -Tema 4: Control de perifèrics en llenguatge ensamblador. Introducció al llenguatge 'C'.</th>
<th>Learning time: 16h</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Theory classes: 4h</td>
</tr>
<tr>
<td></td>
<td>Laboratory classes: 2h</td>
</tr>
<tr>
<td></td>
<td>Self study: 10h</td>
</tr>
</tbody>
</table>

### Description:
(ENG) Temporitzadors i Comptadors del µC 87C51.  
Sistema d'interrupció del µC 87C51.  
Llenguatge 'C'; sintaxi, variables i operadors.
### (ENG) - Tema 5

#### Learning time: 16h
- Theory classes: 4h
- Laboratory classes: 2h
- Self study: 10h

#### Related activities:
- Estudí individual
- Resolució d'exercicis
- Treballs de cerca d'informació
- Pràctiques de laboratori

### (ENG) - Tema 6: Control de perifèrics en llenguatge 'C'.

#### Learning time: 16h
- Theory classes: 4h
- Laboratory classes: 2h
- Self study: 10h

### (ENG) - Tema 7: Supervisors de uC's

#### Learning time: 16h
- Theory classes: 4h
- Laboratory classes: 2h
- Self study: 10h

### (ENG) - Avaluació competència de treball en equip (grups individuals).

#### Learning time: 12h
- Laboratory classes: 2h
- Self study: 10h

### (ENG) - Avaluació competència de treball en equip (II); defensa individual de grups.

#### Learning time: 14h
- Self study: 14h

### (ENG) - Avaluació competència de treball en equip (III); defensa individual de grups.

#### Learning time: 14h
- Self study: 14h
Planning of activities

<table>
<thead>
<tr>
<th>Teamwork Activity</th>
<th>Hours: 60h</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Laboratory classes: 60h</td>
</tr>
</tbody>
</table>

**Description:**
Design and production of electronic measuring systems and / or microcontroller-based control. Students form small groups and work in the design and practical realization of electronic circuits with microcontroller from the guidelines and directives receiving teacher for 15 weeks of the course. The temporal scope of work is 19 weeks, during which the group is working on making schemes, the evaluation of design alternatives in the acquisition of necessary materials, assembly and verification of operation and clothing the application program.

Qualification system

Partial control: 25%
Practices: 20%
Last control: 30%
Other tests: 25%

Regulations for carrying out activities

The evaluation method of this course meets the current academic regulations to be qualified: NO REVALUABLE

Bibliography

**Basic:**


**Complementary:**

**Others resources:**