### Degree competences to which the subject contributes

**Specific:**

1. Design analogue, digital and power systems.

**Transversal:**

3. 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.

### Teaching methodology

The methodology is based in lectures and exercises that are proposed regularly to be done in the classroom and out of it. Also, laboratory exercises are done every two weeks at the laboratories of the subject.
820224 - ELDI - Digital Electronics

Acquire the fundamental concepts of digital circuit design tools and platforms available to perform them.

<table>
<thead>
<tr>
<th>Study load</th>
<th>Hours large group:</th>
<th>Hours medium group:</th>
<th>Hours small group:</th>
<th>Guided activities:</th>
<th>Self study:</th>
<th>Total learning time: 150h</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hours large group:</td>
<td>45h</td>
<td>0h</td>
<td>15h</td>
<td>0h</td>
<td>90h</td>
<td>150h</td>
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<tr>
<td>Hours medium group:</td>
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<td>Hours small group:</td>
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<tr>
<td>Self study:</td>
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Study load

Total learning time: 150h

- Hours large group: 45h (30.00%)
- Hours medium group: 0h (0.00%)
- Hours small group: 15h (10.00%)
- Guided activities: 0h (0.00%)
- Self study: 90h (60.00%)
### Content

<table>
<thead>
<tr>
<th><strong>Introduction and review of previous concepts</strong></th>
<th><strong>Learning time:</strong> 7h 30m</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description:</td>
<td>Theory classes: 3h</td>
</tr>
<tr>
<td></td>
<td>Laboratory classes: 0h</td>
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<tr>
<td></td>
<td>Self study: 4h 30m</td>
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</tbody>
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<table>
<thead>
<tr>
<th><strong>High Level Hardware Design Basics</strong></th>
<th><strong>Learning time:</strong> 11h 15m</th>
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</thead>
<tbody>
<tr>
<td>Description:</td>
<td>Theory classes: 1h 30m</td>
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<tr>
<td></td>
<td>Laboratory classes: 3h</td>
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<tr>
<td></td>
<td>Self study: 6h 45m</td>
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</tbody>
</table>

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<thead>
<tr>
<th><strong>Combinational blocks</strong></th>
<th><strong>Learning time:</strong> 16h 15m</th>
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</thead>
<tbody>
<tr>
<td>Description:</td>
<td>Theory classes: 4h 30m</td>
</tr>
<tr>
<td></td>
<td>Laboratory classes: 2h</td>
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<tr>
<td></td>
<td>Self study: 9h 45m</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Sequential blocks</strong></th>
<th><strong>Learning time:</strong> 16h 15m</th>
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</thead>
<tbody>
<tr>
<td>Description:</td>
<td>Theory classes: 4h 30m</td>
</tr>
<tr>
<td></td>
<td>Laboratory classes: 2h</td>
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<tr>
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<td>Self study: 9h 45m</td>
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</tbody>
</table>

Brief overview of the knowledge acquired in the course Electronic Systems.

Introduction and basics of digital electronic system design using high-level descriptions and programmable logic devices.

Description, operation and use of common combinational blocks.

Description, operation and use of basic common sequential blocks.
## Sequential Systems

**Description:**
Analysis and design of sequential systems of medium complexity.

### Learning time:
- Theory classes: 4h 30m
- Laboratory classes: 2h
- Self study: 9h 45m

## Finite State Machines (FSM)

**Description:**
Analysis and Design of Finite State Machines

### Learning time:
- Theory classes: 4h 30m
- Laboratory classes: 2h
- Self study: 12h

## Arithmetic Systems and Binary Arithmetics

**Description:**
Description and use of the numerical systems used in digital electronics. Analysis and design of arithmetic blocks.

### Learning time:
- Theory classes: 3h
- Self study: 4h 30m

## Electrical characteristics

**Description:**
Description of voltage levels and delays of logic gates and digital blocks. Calculation of limit working electrical conditions.

### Learning time:
- Theory classes: 3h
- Laboratory classes: 2h
- Self study: 7h 30m

## Algorithmic State Machines (ASM)

**Description:**
Analysis and Design of Algorithmic State Machines. The datapath and the control unit.

### Learning time:
- Theory classes: 6h
- Self study: 9h
End mark = 0.20*(lab)+0.20*(homework exercises)+0.20*(mid-term test/s)+0.40*(final exam)

There is no re-assessment exam in this course.

Qualification system

Regulations for carrying out activities

Is mandatory to have completed the lab exercises and bring ID or other identification on the day of the periodic controls and final exam.
Bibliography

Basic:


Complementary:


