The main aim of the course is to introduce programmable logic devices (PLD's) as a practical tool for implementing digital systems such as digital signal processors and discrete-time controllers.

The course will introduce VHDL as the programming language for the design, implementation and test of digital systems. At the end of the course, students are expected to design, implement and test a digital system in areas such as control automation or signal processing.
820256 - PDCA - Programmable Devices for Control and Automation

### Study load

<table>
<thead>
<tr>
<th>Content</th>
<th>Total learning time: 150h</th>
<th>Hours large group: 30h</th>
<th>20.00%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Hours medium group: 0h</td>
<td></td>
<td>0.00%</td>
</tr>
<tr>
<td></td>
<td>Hours small group: 15h</td>
<td></td>
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<td></td>
<td>Guided activities: 15h</td>
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</tr>
<tr>
<td></td>
<td>Self study: 90h</td>
<td></td>
<td>60.00%</td>
</tr>
</tbody>
</table>

### Content

#### (ENG) Introduction to Programmable Logic Devices

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

**Description:**

(ENG) Architecture of PLDs. Different types of PLD: ROM, PLD, CPLD, FPGA. Technologies for the programmable elements.

#### (ENG) Design, implementation and test of digital systems

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

**Description:**

(ENG) Introduction to Hardware Description Languages: VHDL. Concurrent and Sequential instructions. VHDL syntax. Testbenching in VHDL.

#### (ENG) Digital Signal Processing

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

**Description:**

(ENG) Digital filters. Implementation in VHDL.

#### (ENG) Discrete-time control systems

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

**Description:**

(ENG) Sampling in control systems. Discrete PID controller. Implementation in VHDL.
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Qualification system

Follow-up exercises: 25%
Final exam: 25%
Laboratory: 25%
Digital systems project: 25%

Bibliography

Basic:

