This subject continues on with the content seen at the end of the 4th. semester in Analog Electronics (ELAN) and comprises two main goals:

1) To continue in the study of more advanced and sophisticated analog electronic circuits, in terms of precision and speed response, in the field of analog signal processing.
2) Getting used to the common processes involved in the construction of PCBs and put them into practice.

### Study load

<table>
<thead>
<tr>
<th>Total learning time: 150h</th>
<th>Hours large group:</th>
<th>15h</th>
<th>10.00%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Hours medium group:</td>
<td>0h</td>
<td>0.00%</td>
</tr>
<tr>
<td></td>
<td>Hours small group:</td>
<td>30h</td>
<td>20.00%</td>
</tr>
<tr>
<td></td>
<td>Guided activities:</td>
<td>0h</td>
<td>0.00%</td>
</tr>
<tr>
<td></td>
<td>Self study:</td>
<td>105h</td>
<td>70.00%</td>
</tr>
</tbody>
</table>

### Content

**(ENG) Block 1 - Introduction: Extension of Linear Amplifier Circuits**

Degree competences to which the content contributes:

**(ENG) Block 2 - Precision Analog Circuits**

Degree competences to which the content contributes:

**(ENG) Block 3 - Mixed Analog and Digital Electronics**

Degree competences to which the content contributes:

**(ENG) Block 4 - Printed Circuit Board Design (PCBs)**

Degree competences to which the content contributes:
Qualification system

Theory and laboratory activities have both the same weight in the final mark of the course (50%). The theory mark is obtained through one mid-term exam (P1) and a final 2nd. mid-term exam (P2).

Lab skills, on the other hand, are evaluated through a two-stage project (PJ). This work requires the implementation of a true electronic system on a PCB. The necessary skills to manufacture PCBs, both software and technical implementation, are evaluated in the first part of the course (LNG), whereas the project itself is evaluated during the 2nd. half of the course (PRJ).

The global mark (GM) is obtained as follows:

\[ GM = 0.25 \times P1 + 0.25 \times P2 + 0.5 \times PJ = 0.25 \times P1 + 0.25 \times P2 + 0.2 \times LNG + 0.3 \times PRJ \]

Regulations for carrying out activities

- Mid-terms:

A handwritten sheet form is allowed during the exam. Participants are also allowed to use a calculator during the exam and answer the exam using a pencil or a blue/black ball pen (red colour is reserved for professor annotations).

Using any kind of computer device with Internet connection (laptop, tablet, mobile phone and so on) is strictly forbidden and causes a negative evaluation.

- Laboratory:

Participants are encouraged to print lab activities from Atenea and bring them to the lab. The use of the PC is restricted to only the common tasks related to circuit design and simulation: Pre-installed software, acquisition of measures from the instruments and annotation of results.

Accessing the Internet for other issues out of the lab activities is strictly forbidden (i.e. Social Networks, e-mail, or any form of personal messaging, among others) as well as using mobile phones during the lab session. No respecting these rules may have negative consequences in the valuation of both LNG and PRJ fields).

The lab project PRJ can be carried out individually or in groups (2 people maximum). Each group must develop a real electronic system in PCB, get it to work and demonstrate its proper operation. The evaluation of the project is carried out by means of a speech presentation in the last lab session of the course which includes the demonstration of circuit operation.

Bibliography