The aim of this subject is to provide the fundamental knowledge and to show the basics of industrial electronics. It will describe the most important technologies of electronic devices and systems available and it will explain the basic
340098 - SEDI-D5010 - Electronic Systems for Design

Methodologies to analyze both digital and analog electronic systems. At the end of the course students will be able to implement their own electronic prototypes.

**Study load**

<table>
<thead>
<tr>
<th>Total learning time: 60h</th>
<th>Hours large group: 45h</th>
<th>75.00%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Hours medium group: 0h</td>
<td>0.00%</td>
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<tr>
<td></td>
<td>Hours small group: 15h</td>
<td>25.00%</td>
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<tr>
<td></td>
<td>Guided activities: 0h</td>
<td>0.00%</td>
</tr>
</tbody>
</table>
### Content

<table>
<thead>
<tr>
<th>Module 1 - Introduction to electronic systems</th>
<th>Learning time: 21h</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Theory classes: 6h</td>
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<tr>
<td></td>
<td>Laboratory classes: 2h</td>
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<tr>
<td></td>
<td>Self study : 13h</td>
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</tbody>
</table>

**Description:**
Historical approach. Definitions of systems and signals. Introduction to electronic systems. Industrial systems. Electronic instrumentation and control systems.

**Related activities:**
- Class sessions include examples in the form of exercises
- Lab activity

Lab activity 1: Instrumentation of the Electronics Laboratory

**Specific objectives:**
Knowing what an electronic system is and describing some examples of electronic systems.

<table>
<thead>
<tr>
<th>Module 2: Discrete components and basic circuit analysis</th>
<th>Learning time: 47h</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Theory classes: 12h</td>
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<tr>
<td></td>
<td>Laboratory classes: 4h</td>
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<td></td>
<td>Self study : 31h</td>
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</table>

**Description:**

**Related activities:**
- Class sessions include examples in the form of exercises
- Lab activities

Lab activity 2: Time response of first order systems.
Lab activity 3: AC-DC Power Supply

**Specific objectives:**
To learn the techniques of basic analysis of resistive circuits. To know how to use the basic discrete semiconductors (rectifier and zener diodes, bipolar transistors)
Knowledge of students about electronics will be evaluated through written exams and lab activities. Theoretical concepts correspond to the 80% weight of student evaluation. As for the lab, the weight is 20%.

Concerning the theory (80%), two written tests will be available, one in the middle of the course and one at the end. The second written test will allow the recovery of the first one. These two tests may be re-evaluated according to School regulations.

Concerning the laboratory (20%), the students will develop guided practical activities and deliver the results of the measures that are expected to be obtained in each of them.
Regulations for carrying out activities

As for the written exams, students can take a scientific calculator, and can use a pencil or black/blue ballpen (the red colour is reserved for teacher corrections and annotations).
Using any kind of electronic device with Internet connection (mobile phone, Tablet, or laptop) according to the current school regulations.

Bibliography

Basic:


