230082 - FDE - Fundamentals of Electronics

Coordinating unit: 230 - ETSETB - Barcelona School of Telecommunications Engineering
Teaching unit: 710 - EEL - Department of Electronic Engineering
Academic year: 2017
Degree: BACHELOR'S DEGREE IN TELECOMMUNICATIONS TECHNOLOGIES AND SERVICES ENGINEERING (Syllabus 2015). (Teaching unit Compulsory)
ECTS credits: 7
Teaching languages: Catalan, Spanish

Teaching staff
Coordinator: Voz Sanchez, Cristobal
Others: Altet Sanahujes, Josep
        Bermejo Broto, Alexandra
        Fernandez Chimeno, Mireya
        Garcies Salva, Pau
        Martin Garcia, Isidro
        Molinas Mata, Pau
        Orpella Garcia, Alberto
        Ortega Villasclaras, Pablo Rafael
        Puigdollers Gonzalez, Joaquin
        Rodriguez Martinez, Angel
        Rubio Sola, Jose Antonio
        Tous Muntaner, Ignacio
        Vargas Drechsler, Manuel Agustin

Degree competences to which the subject contributes

Generical:
10 ECI N1. They will have acquired knowledge related to experiments and laboratory instruments and will be competent in a laboratory environment in the ICC field. They will know how to use the instruments and tools of telecommunications and electronic engineering and how to interpret manuals and specifications. They will be able to evaluate the errors and limitations associated with simulation measures and results.

Teaching methodology

Theoretical classes
Laboratory classes
Cooperative work (out of classrooms)
Individual work (out of classrooms)
Short answer controls (Test)
Long answer controls
Long answer controls (Final examination)
Laboratory
Laboratory examination

Learning objectives of the subject
# 230082 - FDE - Fundamentals of Electronics

## Study Load

<table>
<thead>
<tr>
<th>Total learning time: 175h</th>
<th>Hours large group:</th>
<th>52h</th>
<th>29.71%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Hours small group:</td>
<td>26h</td>
<td>14.86%</td>
</tr>
<tr>
<td></td>
<td>Self study:</td>
<td>97h</td>
<td>55.43%</td>
</tr>
</tbody>
</table>
# Content

<table>
<thead>
<tr>
<th>Analysis of electric circuits</th>
<th>Learning time: 50h</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Theory classes: 20h</td>
</tr>
<tr>
<td></td>
<td>Self study : 30h</td>
</tr>
</tbody>
</table>

**Description:**

<table>
<thead>
<tr>
<th>The capacitor and the inductor</th>
<th>Learning time: 12h</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Theory classes: 5h</td>
</tr>
<tr>
<td></td>
<td>Self study : 7h</td>
</tr>
</tbody>
</table>

**Description:**

<table>
<thead>
<tr>
<th>The junction diode and its applications</th>
<th>Learning time: 25h</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Theory classes: 10h</td>
</tr>
<tr>
<td></td>
<td>Self study : 15h</td>
</tr>
</tbody>
</table>

**Description:**

<table>
<thead>
<tr>
<th>The transistor and the signal amplifier</th>
<th>Learning time: 25h</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Theory classes: 10h</td>
</tr>
<tr>
<td></td>
<td>Self study : 15h</td>
</tr>
</tbody>
</table>

**Description:**
Learning time: 60h
Laboratory classes: 26h
Self study: 34h

Laboratory of Electronic

Description:
1. Presentation of the Laboratory
2. The power source and the digital multimeter
3. Electric measurements in DC
4. The oscilloscope and function generator
5. Introduction to the operational amplifier
6. Introduction to RC circuits
7. Control of electronic instrumentation
8. Fabrication of a wave square generator
9. Electric characteristic of a diode, LED and Zener
10. The transformer, rectifying circuits and capacitor filter.
11. The bipolar junction transistor: DC analysis
12. Signal amplification with a bipolar junction transistor

Qualification system
Laboratory: 20% (20% practice, 40% instrumentation exam, 40% laboratory exam)
Midterms: 40%
Final exam: 40%

Bibliography
Basic:

Complementary: