230082 - FDE - Fundamentals of Electronics

Coordinating unit: 230 - ETSETB - Barcelona School of Telecommunications Engineering
Teaching unit: 710 - EEL - Department of Electronic Engineering
Academic year: 2019
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
Lopez Gonzalez, Juan Miguel
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

General:
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
# Study load

<table>
<thead>
<tr>
<th></th>
<th>Hours large group:</th>
<th>Hours small group:</th>
<th>Self study:</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total learning time:</strong></td>
<td>175h</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>52h</td>
<td>26h</td>
<td>97h</td>
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<tr>
<td></td>
<td>29.71%</td>
<td>14.86%</td>
<td>55.43%</td>
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</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>
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<tr>
<td></td>
<td>Self study: 7h</td>
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</tbody>
</table>

**Description:**

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

**Description:**
Laboratory of Electronic

<table>
<thead>
<tr>
<th>Laboratory of Electronic</th>
<th>Learning time: 60h</th>
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<tbody>
<tr>
<td></td>
<td>Laboratory classes: 26h</td>
</tr>
<tr>
<td></td>
<td>Self study: 34h</td>
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</tbody>
</table>

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:
