Course guide
230082 - FDE - Fundamentals of Electronics

Unit in charge: Barcelona School of Telecommunications Engineering
Teaching unit: 710 - EEL - Department of Electronic Engineering.
Degree: BACHELOR'S DEGREE IN TELECOMMUNICATIONS TECHNOLOGIES AND SERVICES ENGINEERING (Syllabus 2015). (Compulsory subject).

Academic year: 2022  ECTS Credits: 7.0  Languages: Catalan, Spanish

LECTURER

Coordinating lecturer: Consultar aquí / See here:
https://telecos.upc.edu/ca/estudis/curs-actual/professorat-responsables-coordinadors/responsables-assignatura

Others: Consultar aquí / See here:
https://telecos.upc.edu/ca/estudis/curs-actual/professorat-responsables-coordinadors/professorat-assignat-idioma

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

To know the electrical magnitudes and learn the laws that allow the analysis of electrical circuits.
To know the most important electrical components and electronic devices, to understand their application in real circuits.
To know the concepts of equivalent circuit and model of an electronic device. To know the main signal amplifier circuits and their characteristic parameters.
To know the instrumentation of electronic laboratories and learn how to do applied electrical measurements.
STUDY LOAD

<table>
<thead>
<tr>
<th>Type</th>
<th>Hours</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hours large group</td>
<td>52,0</td>
<td>29.71</td>
</tr>
<tr>
<td>Hours small group</td>
<td>26,0</td>
<td>14.86</td>
</tr>
<tr>
<td>Self study</td>
<td>97,0</td>
<td>55.43</td>
</tr>
</tbody>
</table>

Total learning time: 175 h

CONTENTS

**Analysis of electric circuits**

**Description:**

**Full-or-part-time:** 50h
Theory classes: 20h
Self study : 30h

**The capacitor and the inductor**

**Description:**

**Full-or-part-time:** 12h
Theory classes: 5h
Self study : 7h

**The junction diode and its applications**

**Description:**
The PN junction diode. Rectifying effect. Breakdown of the diode.

**Full-or-part-time:** 25h
Theory classes: 10h
Self study : 15h
The transistor and the signal amplifier

Description:

Full-or-part-time: 25h
Theory classes: 10h
Self study: 15h

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

Full-or-part-time: 60h
Laboratory classes: 26h
Self study: 34h

GRADING SYSTEM

Laboratory: 20% (20% practice, 40% instrumentation exam in the laboratory, 40% final laboratory exam)
Theory: 80% (40% midterm exam, 60% final exam)
Reassess of theory (80% of the subject) according to regulation. The laboratory mark (can not be reassessed) will be that of the course with the same weight (20% of the subject).

BIBLIOGRAPHY

Basic:

Complementary: