Course guide
3200371 - ELP1 - Power Electronics I

Unit in charge: Terrassa School of Industrial, Aerospace and Audiovisual Engineering
Teaching unit: 710 - EEL - Department of Electronic Engineering.
Degree: BACHELOR'S DEGREE IN INDUSTRIAL ELECTRONICS AND AUTOMATIC CONTROL ENGINEERING (Syllabus 2009). (Compulsory subject).

Academic year: 2022  ECTS Credits: 4.5  Languages: Catalan, Spanish

LECTURER
Coordinating lecturer: Lamich Arocas, Manuel
Others: Suñe Socias, Victor Manuel

PRIOR SKILLS
To ensure that students are able to follow and assimilate the content of the subject, they will be expected to have passed the second-year subjects Electrical Systems and Electronic Systems.

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:
1. ELO: Knowledge of the foundations and applications of digital electronics and microprocessors
2. ELO: Applied knowledge of electrotechnics.
3. ELO: Capability for designing analog, digital and power electronic systems.

Transversal:
3. SELF-DIRECTED LEARNING - Level 2: Completing set tasks based on the guidelines set by lecturers. Devoting the time needed to complete each task, including personal contributions and expanding on the recommended information sources.
4. TEAMWORK - Level 2: Contributing to the consolidation of a team by planning targets and working efficiently to favor communication, task assignment and cohesion.

TEACHING METHODOLOGY

LEARNING OBJECTIVES OF THE SUBJECT

Review the basics of electrotechnics that are necessary to understand the subject.
Analyse the various types of semiconductors used in power electronics.
Understand the types and basic structures of static power converters and learn to interpret and analyse their functioning.
Learn to select and calculate the size of the various active and passive elements that make up a power converter.
Become familiar with the various drive systems of direct-current and alternating-current motors.
Understand the various fields of application of the presented topologies.
STUDY LOAD

<table>
<thead>
<tr>
<th>Type</th>
<th>Hours</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hours small group</td>
<td>22.5</td>
<td>20.00</td>
</tr>
<tr>
<td>Self study</td>
<td>67.5</td>
<td>60.00</td>
</tr>
<tr>
<td>Hours large group</td>
<td>22.5</td>
<td>20.00</td>
</tr>
</tbody>
</table>

Total learning time: 112.5 h

CONTENTS

**TOPIC 1: Introduction**

**Description:**
Pending

**Full-or-part-time:** 25h
- Theory classes: 8h
- Practical classes: 2h
- Self study: 15h

**TOPIC 2:**

**Description:**
Pending

**Full-or-part-time:** 36h 15m
- Theory classes: 10h
- Practical classes: 2h 30m
- Laboratory classes: 2h
- Self study: 21h 45m

**TOPIC 3:**

**Description:**
Pending

**Full-or-part-time:** 50h
- Theory classes: 12h
- Practical classes: 3h
- Laboratory classes: 5h
- Self study: 30h

GRADING SYSTEM

For those students who meet the requirements and submit to the reevaluation examination, the grade of the reevaluation exam will replace the grades of all the on-site written evaluation acts (tests, midterm and final exams) and the grades obtained during the course for lab practices, works, projects and presentations will be kept.

If the final grade after reevaluation is lower than 5.0, it will replace the initial one only if it is higher. If the final grade after reevaluation is greater or equal to 5.0, the final grade of the subject will be pass 5.0.
BIBLIOGRAPHY

Basic: