16220 - AEPO-U2P10 - Applications of Power Electronics

Coordinating unit: 340 - EPSEVG - Escola Politècnica Superior d'Enginyeria de Vilanova i la Geltrú
Teaching unit: 710 - EEL - Department of Electronic Engineering
Academic year: 2012
Degree: (ENG) ENGINYERIA EN AUTOMATICA I ELECTRONICA INDUSTRIAL (Syllabus 2003). (Teaching unit Optative)
Credits: 6
Teaching languages: Catalan, Spanish, English

Teaching staff
Others: Miguel Castilla Fernandez

Learning objectives of the subject
The subject introduces the main applications of power electronic systems, from DC/DC regulation, low-harmonic rectification to the generation of signals of AC power for several industrial applications.
## Applications of Power Electronics

**Description:**
- **Objectives**
The aim of the course is to familiarize the student with the main applications and the future trends of power electronic circuits and their typical loads. Also, the student will be able to select the most suitable configuration for a determined application, as much with respect to the power circuit topology as the control configuration.

**Contents**
1. DC/DC regulators for modern microprocessors.
2. DC/DC regulators for aerospace applications.
4. Active power filters.
5. Inverters for AC control.
6. Inverters for induction cooking.
7. High-frequency inverters for lighting systems.
8. Photovoltaic systems with grid interconnection.
9. Aeolian systems with grid interconnection.

## Laboratory

**Description:**
- **Objectives**
To apply simulation tools for the study, analysis, design and evaluation of electronic power systems.

**Contents**
1. Power supply for the Intel Pentium IV microprocessor.
2. Nonlinear loads with low harmonic content.
3. Supplying a lighting system.
4. Photovoltaic system with grid interconnection.

## Project

**Description:**
- **Objectives**
To apply the theoretical knowledge and the simulation tools to the design of an electronic power system. To evaluate the benefits of the studied system.

**Contents**
The detailed study of an actual application of power electronics, selected among a set of proposals. The work will be carried out in groups. Each group can be made up of two or three students. The standard phases of a project will be followed: collection of information, selection of the power circuit topology, design and simulation of the electronic system (power circuit and control configuration, experimental verification, conclusions).
**Qualification system**

Mark = 0.6* (Mark for Project) +0.4* (Mark for Laboratory work)  
Mark for Laboratory work = 0.25*P1+0.25*P2+0.25*P3+0.25*P4.

**Bibliography**

**Basic:**


**Complementary:**
