

Course Unit Description - (MAELE)

(Special Electrical Machines)

(Mestrado em Engenharia Electrotécnica - Sistemas Eléctricos de Energia)

Academic year: 2009/2010

Subject group: Sistemas de Energia

| | Semestral | Optional |
|----------------------|----------------|-------------------------|
| Mode of study | Diurno | Hours/Week T-Teórica |
| Year | 1 ^o | PL-Prática-Laboratorial |
| Semester | 1 ^o | OT-Orientação Tutorial |

ECTS 7.5

Objectives

General Objectives:

The student should be capable of:

- Analyze, characterize and select non conventional machines
- Work on projects that involve special machines
- Analyze the dynamics of electrical machines

Course Contents

1. Electrical Machines standards
2. Special Electrical Machines – Characterization, Mathematical models, Main applications and functioning problems of single phase induction motor, universal reluctance motor and permanent magnet synchronous motor.
3. Stepper Motors – Characterization, main applications and problems
4. Electrical machines dynamic analysis.

Recommended reading

Vincent del Toro, "Fundamentos de Máquinas Eléctricas", LTC – Livros Técnicos e Científicos, 1999

Nuno Gomes, "Introdução aos Motores de Passo-a-Passo", ISEP, 1998

J. C. Palma, "Accionamientos Electromecánicos de Velocidade Variável", Fundação Calouste Gulbenkian, 1999

Gil Marques, "Controlo de Motores Eléctricos", 1999

Rakosh Das Begamudre, "Electromechanical Energy Conversion with Dynamics Of Machines", New Age Publishers, 1998

Teaching Methods

Case presentation and solving

Discussion

Autonomous Work Development

Development of laboratory projects

Several activities, such as: reading, analysis and commentary of references concerning the course contents; presentation of cases and computer application participation in talks and demonstration sessions.

Assessment methods

The final classification of the discipline depends on two components. One component (NFREQ) results from the classification of one practical Work. The work is done in group and is compulsory for all students. The minimum classification for this component is 10.

The second component (PE) consists of an exam. The minimum classification for the exam is 7,5.

The final classification can be calculated using the following formula.

$$\text{Final Classification} = 0,4 * PE + 0,6 * NFREQ$$

| | Name |
|-----------------------------|---|
| Teacher responsible: | Nuno Filipe da Fonseca Bastos Gomes (NBG) |
| Lecturer: | Nuno Filipe da Fonseca Bastos Gomes (NBG) Pedro Miguel Azevedo de Sousa Melo (PMA) |