

Academic Year/course: 2021/22

## 67242 - Modeling and Control of Power Electronic Systems

### Syllabus Information

**Academic Year:** 2021/22

**Subject:** 67242 - Modelado y control de sistemas electrónicos de potencia

**Faculty / School:** 110 - Escuela de Ingeniería y Arquitectura

**Degree:** 622 - Master's in Electronic Engineering

**ECTS:** 6.0

**Year:** 1

**Semester:** First semester

**Subject Type:** Optional

**Module:**

### 1. General information

### 2. Learning goals

### 3. Assessment (1st and 2nd call)

### 4. Methodology, learning tasks, syllabus and resources

#### 4.1. Methodological overview

The learning-teaching process will be developed in three main levels: exposition of needs or requirements, search and implementation of solutions and laboratory work, with increasing student participation.

- In the exposition of needs real case studies will be presented in which the concept or tool object of learning is required.
- In the search and implementation of solutions, the tools and concepts that cover the previously stated needs will be proposed and analyzed.
- In the laboratory practices the previously proposed tools and concepts will be implemented

#### 4.2. Learning tasks

A01 Lecture (20 hours)

In this activity, the problems or challenge scenarios will be exposed and work will be carried out, as a group and individually, in pursuit of the resolution of the problems or challenge scenarios proposed. The teacher will propose and explain, when necessary, the tools and methodologies that enable the resolution of these problems or challenge scenarios.

A02 Practice session (10 hours)

This activity is at the service and complements the work done in the Lecture activity.

A03 Laboratory session (15 hours)

The practices are structured in 6 sessions of 2.5 hours each. All of them are at the service and complement the work done in the Lecture activity.

A06 Assignments (40 horas)

A07 Autonomous work (63 horas)

A08 Assessment tests (2 hours)

#### 4.3. Syllabus

- T1: Exact modeling of static converters.
- T2: Averaged modeling of static converters.
- T3: Linearization of nonlinear systems.
- T4: Control of static converters.
- T5: Power electronics systems for the control of electrical machines.
- T6: Power electronics systems for bidirectional conversion of electrical energy.

#### **4.4. Course planning and calendar**

The lectures, problems and laboratory sessions will be organized according to established schedule by the center (timetables available on its website). The rest of activities will be planned based on the number of students and will be announced well in advance

#### **4.5. Bibliography and recommended resources**

Available at <http://moodle.unizar.es>

Slides of the lecture, Laboratory session scripts, and complementary teaching materials (a set of useful materials: manufacturers' catalogs, component datasheets, laboratory instrumentation manuals, etc.)

<http://psfunizar10.unizar.es/br13/egAsignaturas.php?codigo=67242&Identificador=C71988>