

## 67238 - Advanced Analog Systems

### Syllabus Information

**Academic Year:** 2021/22

**Subject:** 67238 - Sistemas analógicos avanzados

**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:** Compulsory

**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 process of teaching and learning designed for this subject is based on three different training activities with increasing student participation as the course progresses: lectures, laboratory sessions and workshops.

- All sessions will have an eminently practical orientation. In the more theoretical lectures, the basis of the advance analog design will be presented, setting out the fundamental aspects of the design flow. In the specific exercise sessions, the focus will be to insist on the methodology to be subsequently applied in the laboratory sessions, encouraging the active participation of the student.
- The second training activity will focus on the laboratory sessions in small groups, where the autonomous work of the student will be encouraged to achieve results in the design of advanced analog systems. The required material to develop these labs will be provided to the student well in advance.
- The third activity is workshop orientated, where the autonomous student work will be encouraged. The required material to develop these activities will be provided to the student well in advance.

#### 4.2. Learning tasks

The program, offered to the students to achieve the learning goals, includes the following activities:

- **Lectures (A01 – 20 hours) and exercises and cases solving (A02 – 10 hours):** In this activity, the fundamental contents of the subject will be presented, with a practical orientation based on the design of electronic systems. The necessary materials will be available to students through the *ADD*.
- **Laboratory sessions (A03 – 20 hours):** This activity is structured in different sessions, covering a total of 20 hours. The scripts will be available to students in the *ADD* well in advance. In these sessions, the required simulation tools and electronic instrumentation will be used, so that students will acquire the skills and abilities necessary to address the design and experimental verification of advanced analog systems and electronic instrumentation.
- **Workshops and/or seminars (A05 - 45 hours y A06 - 5 hours):** In this activity both workshop type activities and the reports elaboration associated to lab sessions are included. In order to meet the requested result, students will have the material provided by the teacher, manufacturers of integrated circuits and on-line resources. The student autonomy, the quality of the solution, and the participation of each of the group members will be considered in the evaluation process for each job.
- **Study and personal work (A07):** This activity includes personal work aimed at achieving adequate pursuit of the subject, conducting lab sessions and the proposed works and the tutoring process.
- **Evaluation tests (A08):** Set of theoretical and experimental tests and reported work that are used in the evaluation of the student progress. Evaluation activity includes performing a global test.

#### 4.3. Syllabus

The distribution into thematic units of the theoretical program of the subject is as follows:

- UNIT 1: Introduction
- UNIT 2: Integrated Circuits (*ICs*): submicronic technologies
- UNIT 3: Amplification
  - Feedback: stability and compensation
  - Single-supply operation
  - Application-specific *AOs*
- UNIT 4: Active filters
- UNIT 5: Precision and low noise design
- UNIT 6: Analog-digital interface

#### 4.4. Course planning and calendar

Both theoretical classes and laboratory sessions are held according to the schedule set by the Faculty. All the activities will be planned depending on the number of students and will be announced well in advance.

Each teacher will inform of the particular tutoring hours.

Taking into account the scope of the subject and its functional nature, theoretical topics will be discussed and advanced design tools will be considered in order to provide the student with the necessary resources to use these techniques in the development of communication systems and electronic instrumentation. Taking advantage of the practice sessions is absolutely essential to fully assimilate the previously explained aspects and acquire the necessary skills to work with the electronic stages and instruments considered. This will allow to strengthen the direct link between theory and practice.

The detailed calendar of the various activities to be carried out will be established once the University and the Faculty have approved the academic calendar (available on the

corresponding website). For guidance:

- **Class period:** first semester (autumn).
- **Theory and exercise-case solving classes:** 2 hours are scheduled every week.
- **Practical sessions:** the student will complete a total of 20 hours.
- **Delivery of works:** the dates and conditions of delivery of the works required throughout the course will be adequately informed with sufficient advance notice.
- There will be a **global test** in 1st call and another in 2nd call on the specific dates indicated by the Faculty.

#### 4.5. Bibliography and recommended resources

<http://psfunizar10.unizar.es/br13/egAsignaturas.php?codigo=67238>