

Academic Year/course: 2022/23

60977 - Microelectronic circuit design

Syllabus Information

Academic Year: 2022/23

Subject: 60977 - Microelectronic circuit design

Faculty / School: 110 - Escuela de Ingeniería y Arquitectura

Degree: 623 - Master's Degree in Telecommunications Engineering

ECTS: 6.0

Year: 2

Semester: Second 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 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 mixed-signal microelectronics design will be presented, setting out the fundamental aspects of the design flow.
- The second training activity will focus on the laboratory sessions in small groups, where the students will work with microelectronic design *CAD* tools.
- The third activity is workshop orientated, where the autonomous student work will be encouraged in order to obtain as a result a complete design of a mixed-signal *IC*. 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 (16 hours) and exercises and cases solving (9 hours):** In this activity, the fundamental contents of the subject will be presented, with a practical orientation based on the mixed-mode microelectronic design. The necessary materials will be

available to students through the *ADD*.

- **Laboratory sessions (15 hours):** This activity is structured in different sessions that require *CAD* tools for microelectronics design, so that students will acquire the skills and abilities necessary to address a mixed *IC* design. The scripts will be available to students in the *ADD* well in advance.
- **Special activities (5 hours):** Visits to specialized laboratories, manufacturing companies, research centers, etc.
- **Workshops and/or seminars (39 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 (60 hours):** 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 (6 hours):** 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: CMOS submicronic technologies
 - Technological process
 - Devices, characterization and modelling
- UNIT 3: Analog design flow
- UNIT 4: Digital design flow
- UNIT 5: Design of analog-digital mixed systems

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.

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:** second semester (spring).
- **Theory and exercise-case solving classes:** 2 hours are scheduled every week.
- **Practical sessions:** the student will complete a total of 15 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=60977>

