Universidad Zaragoza

Academic Year/course: 2021/22

39128 - Physical Electronics

Syllabus Information

Academic Year: 2021/22
Subject: 39128 - Electrónica física
Faculty / School: 100 - Facultad de Ciencias
Degree: 577 - Joint Program in Physics and Mathematics
ECTS: 6.0
Year: 4
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

Considering the general objectives of this course, the designed learning process is based on the acquisition of theoretical knowledge, problem solving skills and the realization of the experimental part, according to the following scheduled activities:

*Participative lectures addressed to the entire group of students, completed with individual or in small groups care tutorial for activity 1 (4 ECTS).

* Problem-based learning and team and individual work for activity 2 (1 ECTS)

*Laboratory work and reports preparation for activity 3 (1 ECTS)

4.2. Learning tasks

1. Classroom lectures comprising the development and discussion of the content of the course, based on the notes and bibliography supplied by the teacher.

2. Problem solving and analysis of case studies related to the contents of the subject, enhancing the interaction between teacher and students.

3. Laboratory sessions: observation, experimental characterization and measurement of semiconductor devices. Preparation of reports containing relevant results and conclusions.

4.3. Syllabus

Part I: Semiconductors

1. Fundamentals

2. Intrinsic and extrinsic semiconductors

3. Carrier transport

Part II. Junction diodes

4. PN junction

5. Junction diodes

Part III. BJT transistors

6. Junction bipolar transistor

7. Bipolar transistor: applications

Part IV. MOS transistors

8. MOS transistor

9. CMOS transistors: applications

Laboratory:

1- Diode Experimental Characterization and extraction of characteristic parameters.

2- Special diodes.

3- BJT Transistors: Static Characteristic and Transfer Functions.

4-MOS Transistors: Static Characteristic and Transfer Functions.

4.4. Course planning and calendar

The distribution of the different programmed activities is:

- Theoretical lectures, seminars and evaluative tests: 4 ECTS
- Resolution of problems and cases: 1 ECTS
- Laboratory sessions: 1 ECTS

The theoretical lectures and problem classes will be taught in the classrooms and times established by the Dean. The distribution of laboratory sessions will be established according to the number of students, the development of the course and the availability of laboratories on the dates established by the Dean.

The written test evaluation sessions are those that the Dean of the Faculty of Sciences determines and publishes each year.

4.5. Bibliography and recommended resources

http://psfunizar10.unizar.es/br13/egAsignaturas.php?codigo=39128