

Academic Year/course: 2022/23

## 30328 - Electronics for Communications

### Syllabus Information

**Academic Year:** 2022/23

**Subject:** 30328 - Electronics for Communications

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

**Degree:** 438 - Bachelor's Degree in Telecommunications Technology and Services Engineering  
581 - Bachelor's Degree in Telecommunications Technology and Services Engineering

**ECTS:** 6.0

**Year:** 3

**Semester:** Second 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 methodology followed in this course is oriented towards achievement of the learning objectives. A wide range of teaching and learning tasks are implemented, such as

- Lectures, where the theoretical basis of the course will be explained.
- Practice sessions with representative design problems are analysed and solved by the students.
- Laboratory sessions with representative scenarios of Electronics for Communications.

Students are expected to participate actively in the class throughout the semester.

#### 4.2. Learning tasks

The course includes the following learning tasks:

- **A01 Lectures (30 hours).** The main contents of the course will be presented and a set of representative problems will be solved. This activity will take place in the classroom. The materials used in the lectures will be available at the beginning of the course.
- **A02 Practice sessions (15 hours).** In this activity, a set of representative problems will be solved. This activity will take place in the classroom.
- **A03 Lab sessions (15 hours).** Lab exercises are structured in 5 sessions of 3 hours each. Description of the tasks will be available to students at the beginning of the course. For reasons of organization (ie number of students), requirement of the Center, or manifest interest of the students, these sessions could be replaced by the assembly of a small communication system that incorporates some of the blocks described in the course, both at the modulation level, such as demodulation and transmission / reception.
- **A05 Course work (20 hours).** Students (alone or in pairs) must solve a problem related to the contents of the course. A practical orientation is encouraged.
- **A07 Study (65 hours).** Time for study, exam preparation and tutorials.

- **A08 Evaluation tests (5 hours).**

### **4.3. Syllabus**

The course will address the following topics:

- Introduction to Electronic Communications.
- Block diagram for an electronic communications system.
- Resonance, impedance transformation, and matching.
- Fundamentals of passive analog filters.
- RF electronics: lumped versus distributed parameters.
- RF amplifiers: fundamentals.
- Mixers: upconversion and downconversion.
- RF oscillators. Voltage Controlled Oscillators (VCOs)
- Introduction to Phase Locked Loops (PLLs)
- Basics of analog and digital modulators/demodulators

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

The schedule of the course, both classroom and laboratory sessions, will be determined by the academic calendar that the University established for the corresponding course.

The course is presented in the second semester of the third year of the degree with a total of 6 ECTS credits. The main activities of the same are divided into lectures, problem-solving and practical cases in class, laboratory practices and performing a puppet work related to course content.

This distribution aims to facilitate the understanding and assimilation of all concepts, both conceptual and practical, presented in the course so that the skills acquired in the same are covered.

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

<http://psfunizar10.unizar.es/br13/egAsignaturas.php?codigo=30328>