

30328 - Electronics for Communications

Syllabus Information

Academic year: 2023/24

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

"**Communications Electronics**" introduces the student to the electronic technology used in electronic communications systems. The electronic components and blocks that are part of a communications system are presented with special emphasis on high frequency work and making use of design, simulation, construction and measurement techniques typical of this field.

These approaches are aligned with some of the Sustainable Development Goals (SDGs) of the United Nations

Agenda 2030 (<https://www.un.org/sustainabledevelopment/es/>) and certain specific goals, so that the acquisition of the learning results of the subject provides training and competence to the student to contribute to some extent to the achievement of Goal 7 (7.3), Goal 8 (8.2,8.4) and Goal 9 (9.5).

2. Learning results

- Ability to identify and analyze all the elements of an information transmission-reception chain from the point of view of electronic systems.
- Ability to specify the basic characteristics of the components of a circuit of Electronics of Communications.
- Ability to design or select basic blocks of an electronic communications system, especially in radio frequency and, more specifically, impedance matching networks, amplifiers, oscillators, mixers, PLLs and filters.
- Ability to understand the electronic techniques for the implementation of analog and digital modulations.
- Acquisition of awareness of the importance of these topics for companies in the electrical/electronic sector.
- Knowledge of the techniques, installations and equipment used in the work with electronic communications systems.

3. Syllabus

- * Introduction to Communications Electronics.
- * Block diagram of a communications equipment.
- * Resonance, transformation and impedance matching.
- * Fundamentals of passive analog filters.
- * RF amplifier stages.
- * Mixers.
- * RF oscillators. VCOs.
- * Introduction to the phase-locked loop (PLL).
- * Introduction to the implementation of modulators and demodulators.

4. Academic activities

- **Lectures:** sessions with the teacher in which the subject matter will be explained: 30 hours
- **Problems and cases:** sessions to solve practical cases posed by the teacher: 15 hours
- **Laboratory practices:** 15 hours. *For internal organizational reasons, these sessions could be replaced at the beginning of the term by the installation of a communications system incorporating the blocks described in the subject. In this case this work will be managed as Coursework.*
- **Practical application or research work:** 20 hours
- **Study and personal work:** 65 hours
- **Assessment tests.** 5 hours

5. Assessment system

Modality: **Global assessment.**

There will be a global test in each one of the exams established throughout the term, whose grade will be obtained in the following way:

1) **Written exam (80%).** It will consist of two parts: the first part will be theoretical and will deal with fundamental concepts the second part is made up of a set of problems or practical assumptions. A grade (C1) from 0 to 8 points will be derived from the exam, representing a weight of 80% of the overall grade.

2) **Practices (20%)** According to the approach taken at the beginning of the term:

a) Laboratory Practices: observation of the quality of the results and the student's working capacity.

b) Course work: analysis of a brief report, quality of the work done, ability to work in a team and presentation to the teacher in charge.

A grade (C2) will be derived from the option developed (a/b), which will represent a weight of 20%.

In the case that during the term the practical part has been developed through Laboratory Practices, those students who have not attended all of them will have to take a laboratory exam (assembly and/or simulation of electronic circuits similar to those developed during the course in the laboratory practicals).

The overall subject grade (out of 10 points) will be $C1+C2$, provided that C1 is greater than or equal to 4 and C2 is greater than or equal to 1. Otherwise, the overall grade for the subject will be the minimum between $C1 + C2$ and 4

The subject is passed with an overall grade of 5 out of 10.