

Academic Year/course: 2022/23

30395 - Expansion of communication electronics

Syllabus Information

Academic Year: 2022/23

Subject: 30395 - Expansion of communication electronics

Faculty / School: 110 - Escuela de Ingeniería y Arquitectura

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

ECTS: 6.0

Year: 4

Semester: First semester

Subject Type: Optional

Module:

1. General information

1.1. Aims of the course

This subject is an extension of the subject "Communications Electronics", the objectives of this subject are based on the design of small communication chains, both in transmitters and receivers.

The foundation of this subject is to integrate and expand the concepts of the previous subjects of theory: Signals, theory of communication, modulations, noise treatment, in practical and concrete examples on electronic techniques.

That is, to construct what was previously studied in a simply conceptual way. In this way, basic competences in Telecommunications are achieved and the previous knowledge to apply it is reinforced. The techniques described are both Analog and Digital.

1.2. Context and importance of this course in the degree

This subject complements the real and applied knowledge of Communications Electronics and communication systems in general in the field of degree. Especially within the itinerary of Electronic Systems.

It works together with the Laboratory of Communications Electronics giving a higher level of training and above all allowing to better understand the previous theories, by practical application in small chains and telecommunications systems.

1.3. Recommendations to take this course

Have studied "Communications Electronics".

2. Learning goals

2.1. Competences

With these subjects the following specific technology competencies are obtained:

CSE1 Ability to build, operate and manage systems for capturing, transporting, representing, processing, storing, managing and presenting multimedia information, from the point of view of electronic systems.

CSE2 Ability to select specialized circuits and electronic devices for transmission, routing and terminals, both in fixed and mobile environments.

CSE3 Ability to perform the specification, implementation, documentation and tuning of equipment and systems, electronic, instrumentation and control, considering both the technical aspects and the corresponding regulatory regulations.

CSE5 Ability to design analog and digital electronics, analog-digital and digital-analog conversion, radio frequency, power and electrical energy conversion circuits for telecommunications and computing applications.

CSE9 Ability to analyze and solve interference and electromagnetic compatibility problems.

2.2. Learning goals

Know and apply the techniques of noise and distortion analysis in electronic communications circuits.

? It is capable of analyzing all the elements of a chain of transmission-reception of information from the point of view of

electronic systems.

? It is capable of selecting, designing and using amplifier circuits, oscillators, mixers and electronic modulators (analog and digital) applied to telecommunications.

? It is able to plan a Communications Electronics system, selecting its architecture and technology.

? It is capable of selecting, designing and using synthesis and frequency control blocks: analog (VCO), mixed (PLL) and digital (digital synthesis).

? It is capable of selecting and using analog and digital modulators.

? Knows how to use most of the possibilities of CAE tools to help design in Communications Electronics.

? Know the applications of Communications Electronics to the transmission of information by any means

2.3. Importance of learning goals

Learning outcomes are part of the backbone of telecommunication systems.

3. Assessment (1st and 2nd call)

3.1. Assessment tasks (description of tasks, marking system and assessment criteria)

An evaluation is proposed with two parts:

T1 - 60% of the score in a written test composed of theoretic questions - practices and evaluation problems

P1 - 40% of the rating obtained through the development of a staged communications system through laboratory practices.

4. Methodology, learning tasks, syllabus and resources

4.1. Methodological overview

Progress in the subject includes slate and laboratory classes. The concept pursued is that of learning by doing, through problems - challenge, together with the design, simulation and assembly in the laboratory of the circuits.

These blocks, coordinated allow to achieve better the competences of the asignatura that with a docencia simply theoretical or with little practice.

4.2. Learning tasks

A01 Master Class 40 hours

A02 Troubleshooting and cases 20 hours

A03 Laboratory practices 60 hours

A05 Carrying out practical application or research work 30 hours

4.3. Syllabus

Introduction to the design of communications systems. Electronic planning of communications systems: architecture, complete design and implementation technologies (analog and digital). Distortion and noise processes in electronic circuits. Specifications and elements of a transmitter. Specifications and elements of a receiver.

4.5. Bibliography and recommended resources

<http://psfunizar10.unizar.es/br13/egAsignaturas.php?codigo=30395>