

Academic Year/course: 2022/23

60985 - High frequency devices design

Syllabus Information

Academic Year: 2022/23

Subject: 60985 - High frequency devices design

Faculty / School: 110 - Escuela de Ingeniería y Arquitectura

Degree: 623 - Master's Degree in Telecommunications Engineering

ECTS: 3.0

Year: 2

Semester: First 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 learning process is based on the following:

PRESENTIAL WORK IN THE LABORATORY

1. Participative Lectures (1 ECTS: 10 hours)
2. Laboratory Practises (1.8 ECTS: 18 hours)
3. Public presentation of a work (0.2 ECTS: 2 hours)

Both will be simultaneous as the development of the practises evolves

NOT PRESENTIAL (Personal work: 45 hours.)

3. Carrying out a supervised work (estimated 12 hours)
4. Carrying out study work on the topics of the practices, documentation, etc.. (33 h estimadas)

4.2. Learning tasks

1. Master Classes in the Laboratory (10 h.) and laboratory practices (18 h.)

The students will carry out 14 laboratory sessions of 2 hours. Both will deal with theoretical concepts necessary to address the developments of the high frequency devices that are being designed.

At the end of the 14 sessions, a date will be chosen within the range of continuous evaluations proposed in the calendar of the EINA for the presentation of group work.

2. Carrying out a supervised work

Based on the contents developed in the subject related to the design of high frequency devices the student will delve into the development of a specific device, of a passive nature, with the possibility of mounting and physical manufacture of the same and its characterization in the laboratory. This work will be presented in public to the rest of students.

4.3. Syllabus

Section 0. Introduction

- Presentation of the subject.
- Basic Knowledge required.
- Introduction to laboratory software
- Introduction to characterization hardware (Vector Network Analyzer)

Section I.

- Analysis and design of couplers of different types.
- Branch Line Coupler Simulation.
- Branch Line application to variable attenuator in transmission.
- Branch Line application to variable attenuator in reflection.
- Aplicación Branch Line a desfasador variable en reflexión.
- Digitally controlled phase shifter design with PIN diode switches.

Section II.

- Design of symmetrical power dividers to feed antenna array.
- Asymmetric power divider design.
- Design of a distribution network for antenna array including phase shifters and attenuators.
- Synthesis of Antenna array example.

4.4. Course planning and calendar

The schedule of the course will be determined by the academic calendar that the EINA established for the corresponding course (<http://eina.unizar.es>).

The dates for carrying out and monitoring the practical work and other scheduled activities will be indicated with sufficient notice by the teacher.

4.5. Bibliography and recommended resources

<https://psfunizar10.unizar.es/br13/egAsignaturas.php?codigo=60985>

Similarly, and taking into account the digital media provided by the University of Zaragoza, students enrolled in the course will be provided with access to a set of materials prepared by the teachers in charge.