

30325 - Radio-Frequency Electronics

Syllabus Information

Academic Year: 2019/20

Subject: 30325 - Radio-Frequency Electronics

Faculty / School: 110 - Escuela de Ingeniería y Arquitectura

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

ECTS: 6.0

Year: 3

Semester: First semester

Subject Type: Compulsory

Module: ---

1.General information

1.1.Aims of the course

1.2.Context and importance of this course in the degree

1.3.Recommendations to take this course

2.Learning goals

2.1.Competences

2.2.Learning goals

2.3.Importance of learning goals

3.Assessment (1st and 2nd call)

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

4.Methodology, learning tasks, syllabus and resources

4.1.Methodological overview

This course is based on the combination of the traditional lecture complemented with many examples in the classroom using real circuits and systems or relying on simulation programs to reinforce the theoretical concepts in a visual and effective way.

The laboratory sessions are oriented to work with RF instrumentation building and debugging RF circuits on printed circuit boards (PCBs). Mentoring and close attention are encouraged.

4.2.Learning tasks

The learning process for this subject is as follows:

CLASSROOM ACTIVITIES

CREDITS: 2.4 ECTS HOURS: 60

Those activities are distributed as follows:

- 1) "Main Lectures" (1.2 ECTS, 30hours). The instructor explains the fundamentals following the contents of the theoretical program. Participation is welcomed.
- 2) "Classes of problems and case studies" (0.6 ECTS, 15 hours) proposed by the teacher, encouraging discussion and participation.

3) "Supervised laboratory sessions" (0.6 ECTS, 15 hours) in electronics lab.

AUTONOMOUS ACTIVITIES

CREDITS: 3.6 ECTS HOURS: 90

- 1) A guided practical exercise if proposed at the beginning of the course.
- 2) Personal study.
- 3) Resolution of doubts with the teacher.
- 4) Evaluation tests.

4.3.Syllabus

The program offered to students to achieve the expected results includes the following activities.

- Introduction to Radio Frequency (RF) electronics.
- Electronic components and devices in RF: modeling and design considering parasitic effects.
- Impedance matching and transformation in RF.
- RF passive filters.
- RF amplifiers: classes, specification and design.
- RF oscillators including VCOs. PLLs.
- RF mixers.
- Attenuators. Directional couplers. Splitters and combiners.
- Practical application of radio frequency electronics
- CAD basics and instrumentation.
- Examples of applications of Radio Frequency Electronic Communications, Industry, Medicine and Science.
Introduction to Electromagnetic Compatibility and electromagnetic interference.

4.4.Course planning and calendar

Calendar and important dates

The calendar, schedules and rooms for any of the activities associated with this course will be made public in advance as required by current normative.

4.5.Bibliography and recommended resources

http://biblos.unizar.es/br/br_citas.php?codigo=30325&year=2019