

Academic Year/course: 2022/23

30374 - Radiation and propagation

Syllabus Information

Academic Year: 2022/23

Subject: 30374 - Radiation and propagation

Faculty / School: 110 - Escuela de Ingeniería y Arquitectura

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

ECTS: 6.0

Year: 3

Semester: First 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

Methodology:

1. Lectures (40 hours) laying the theoretical foundations of the course. This task will be classroom-based and will rely on material previously delivered to the student (or available online).
2. Problems and case studies (10 hours). Problems and cases appointed by the instructor, to be solved by the students or the teacher himself, based on the programmed lectures. This activity will be classroom-based.
3. Lab Sessions (10 hours). 5 laboratory assignments of 2 hours each, to be performed in laboratories L.3.06 (Laboratorio de Alta Frecuencia) and/ or L.2.0.2 at the Ada Byron building whenever possible, under the actual circumstances. Small groups of students will carry out simulations and experimental measurements using test equipment related to radio and acoustic wave radiation and propagation, in order to support the knowledge acquired during the lectures. This activity will require presence at the laboratory.
4. Group assignment (24 hours). A course project, under instructor supervision, will be assigned to each group. The course project should deal with the electromagnetic or acoustic modelling of some application focused on the Telecommunication field.
5. Personal attention through academic tutoring.

4.2. Learning tasks

Classroom-based learning:

Lectures and cases according to the detailed syllabus on section 4.3 will be preliminary focused on the following topics:

Laboratory:

1. Basic Antenna Parameters.
2. Indoor Radiowave Propagation.

3. Basic radiating elements.
4. Antenna and sensor arrays.
5. Radio Link budgets: atmospheric refraction and obstacle diffraction modelling.

Group assignment

Transducer Physical and Mathematical Model development.

4.3. Syllabus

Unit 1. Transmission line Foundations.

Unit 2. Introduction: radio transmitters and receivers.

Unit 3. Basic Antenna modelling in Radio-communications.

Unit 4. Electromagnetic and acoustic analysis of radiating elements.

Unit 5. Radiowave Propagation.

4.4. Course planning and calendar

Distribution of activities:

- Lectures and problems: four hours a week during the semester
- 5 laboratory sessions of 2 hours each, in reduced groups

Lecture and laboratory session schedules together with evaluation dates will be provided by the university before the beginning of the semester.

4.5. Bibliography and recommended resources

<http://psfunizar10.unizar.es/br13/egAsignaturas.php?codigo=30374>