Universidad Zaragoza

Academic Year/course: 2022/23

30385 - Antennas and radio transmission devices

Syllabus Information

Academic Year: 2022/23
Subject: 30385 - Antennas and radio transmission devices
Faculty / School: 110 - Escuela de Ingeniería y Arquitectura
Degree: 581 - Bachelor's Degree in Telecomunications Technology and Services Engineering
ECTS: 6.0
Year: 4
Semester: Second 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

Learning planning which concerns the teaching methodology in this course is based on the following.

1. Lectures. - Teacher presentation or explanation in class (with possible proofs and demos).

2. Based problem Learning and assignments.-Oriented approach so that the students learn by means of real problems in small groups under tutor supervision.

3. Laboratory.- Activities in special spaces with specialized equipment (laboratory, computer rooms).

4 Theoretical works. Preparation of seminars, lectures, research papers, reports, etc. to be presented or delivered in class.

5. Grading.-Set of written, oral tests, practices, projects, jobs, etc. used to assess student skills.

6. Personal Assessment- tutor meetings to review and discuss the materials and topics presented in lectures.

4.2. Learning tasks

The course includes the following learning tasks:

  1. Class Lectures (40 hours) in which the theoretical foundations of the contents of the subject are presented and where student participation is encouraged.

2. Problems and case studies (10 hours) in which problem-solving and practical cases are held.

3. Laboratory Practice (10 hours) in which students will perform 5 Lab sessions of 2 hours.

4. Practical group work, supervised by the teacher, based on the course contents and public presentations.

5. Personalized assessment to students through individual meetings.

4.3. Syllabus

The course will address the following topics:

1. Review of Electromagnetic radiation principles.

1.1 Fields for electric and magnetic current sources.

1.2 Uniqueness and volume equivalence theorems

1.3 Electric and Magnetic Fields for Electric and Magnetic Current Sources.

2. Aperture Antennas Analysis

2.1 Aperture Antennas

2.2 Slots Antennas.

2.3 Horn Antennas

2.4 Parabolic Reflector Antennas

3 Broadband Antennas Analysis

3.1 Traveling wave antenna

3.2 Helical Antenna

3.3 Yagui-Uda antenna

3.4 Frequency Independent Antenna

3.5 Log-Periodic Antenna

4 Feed Antenna Networks

4.1 Array analysis review

4.2 N-port network review

4.2 Feed Antenna Netwoks and adjusting devices

Laboratory Practices

Laboratory Practice 1. Rectangular and circular aperture radiation parameters.

Laboratory Practice 2. Horn antenna radiation parameters.

Laboratory Practice 3. Parabolic Reflector radiation parameters.

Laboratory Practice 4. Slot Antenna.

Laboratory Practice 5. Feed network for planar array.

Supervised Projects and Seminars Student Project which deals with the design and development of supervised assessments and their presentation as a workshop.

4.4. Course planning and calendar

The following distribution of activities throughout the semester are scheduled:

- Weekly sessions of lectures, which include problem-solving sessions that cover a total of 50 hours.

- 5 2-hour Lab sessions in small groups.

- Personal Assessment meetings are flexible and agreed for convenience between students and professors.

Problem Lectures and laboratory sessions are held according to the schedule set by the University. Timetables will be announced on the EINA website.

As far as grading is concerned, partial (midterm) written examination dates will be announced by the university and be carried out in two parts, at mid-course and at the end of the course. It will be announced in advance.

Related Final examination shall be proposed by the University.

4.5. Bibliography and recommended resources

http://psfunizar10.unizar.es/br13/egAsignaturas.php?codigo=30385