Academic Year/course: 2022/23

30305 - Signals and systems

Syllabus Information

Academic Year: 2022/23

Subject: 30305 - Signals and systems

Faculty / School: 110 - Escuela de Ingeniería y Arquitectura

Degree: 330 - Complementos de formación Máster/Doctorado
　　　　　581 - Bachelor's Degree in Telecomunications Technology and Services Engineering

ECTS: 6.0

Year: 581 - Bachelor's Degree in Telecomunications Technology and Services Engineering: 2
330 - Complementos de formación Máster/Doctorado: XX

Semester: First semester

Subject Type: 581 - Compulsory
330 - ENG/Complementos de Formación

Module:

1. General information

2. Learning goals

3. Assessment (1st and 2nd call)

4. Methodology, learning tasks, syllabus and resources

4.1. Methodological overview

In order for students to achieve the learning outcomes described above and acquire the skills designed for this course, the following teaching-learning methodologies are proposed:

- M1: Participative Lecture
- M3: Group work
- M4: Problem-based learning
- M8: Classroom Practices
- M9: Lab
- M10: Tutoring
- M11: Assessment of student progress
- M13: Practical work
- M14: Theory study
- M15: Practical study

4.2. Learning tasks

The course includes the following learning tasks:

- Participative Master Class.

In this activity (40 hours) the teacher makes the presentation of the contents of the course. Examples of the use of Matlab / Octave software for solving exercises and problems will be presented to the students.

- Lab practices.

This activity will be conducted using a computer. It will include 5 sessions of 2 hours each. Prior to the laboratory session, students will perform a preliminary study to work on the concepts that will be addressed during the practices. At the end of the session, students will perform a questionnaire relating to the work done.

- Classroom practices.

This activity (10 hours) will be addressed by the students individually and / or group. The teacher will propose to the students a number of problem-solving and case studies related to the agenda of the subject and will be responsible for tutoring them. Students solve problems and proposed cases and submit results written or oral.

- Problem-solving

With some regularity, teachers will propose students the resolution, outside the classroom practices in groups, of problems concerning the agenda of the subject and whose level of difficulty will be similar to the final exam. In the deadlines set in each case, students will submit their proposed solutions to problems. They may also be requested to submit comparative reports between their solution and the one provided by the teachers.

- Supervised practical work.

In this activity, the teacher will propose students solving various practical tasks related to the content addressed in the course. Students will work as a group in applying the knowledge to successfully solve practical cases raised. After the completion of practical work, each student group issued a document containing the results and the code used to obtain these results. Professor periodically monitors the progress of job status and resolve any questions that each group of students raised in the resolution of the same.

4.3. Syllabus

The course will address the following topics:

- 1. Programming with Matlab / Octave
- 2. Signals and systems in the time domain
    - 2.1 Signals
    - 2.2 Systems
- 3. Linear and Time-Invariant Systems
    - 3.1 Convolution and impulse response
    - 3.2 Systems defined by differential equations and difference equations
    - 3.3 Correlation
- 4. Frequency representation of signals
    - 4.1 Continuous-time periodic signals: Fourier series expansion
    - 4.2 Continuous-Time Fourier Transform
- 5. Systems Analysis
    - 5.1 LTI Systems: frequency response
    - 5.2 Applications
    - 5.3 Laplace Transform

4.4. Course planning and calendar

The timing of the subject, both classroom hours as well as the laboratory sessions will be defined by the center in the academic calendar of the corresponding course. 5 laboratory sessions 2 hours each will be made. The detailed study of the course with the dates of each session calendar, as well as the delivery of exercises will be available through the educational platform "Moodle" of the University of Zaragoza.

4.5. Bibliography and recommended resources

http://psfunizar10.unizar.es/br13/egAsignaturas.php?codigo=30305