

Academic Year/course: 2020/21

30357 - Signal Processing and Communications Laboratory

Syllabus Information

Academic Year: 2020/21

Subject: 30357 - Signal Processing and Communications Laboratory

Faculty / School: 110 - Escuela de Ingeniería y Arquitectura

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

ECTS: 6.0

Year: 4

Semester: Second semester

Subject Type: Optional

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

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

- M1: Lecture
- M2: Seminar
- M3: Teamwork
- M7: Presentation of teamwork
- M8: Practical classes
- M9: Laboratory
- M10: Tutoring
- M11: Evaluation
- M12-M13: Theoretical and practical work
- M14-M15: Theoretical and practical study
- M16: Complementary activities

4.2. Learning tasks

The program offered to help the student achieve the expected results includes the following activities

Lectures.

This activity will be conducted in the classroom (11 hours). The professor shall present the course contents:

- Theoretical introduction to lab projects.
- Explanation of supervised assignments to be performed.
- When appropriate, presentations on software and/or hardware necessary for the supervised assignments.
- Students' presentation of supervised assignments.

Lab projects.

This activity will be conducted in a computer lab. It will comprise 14 sessions of 2 hours each. In general, each lab project will last 2 or 3 2-hour sessions, so there will be up to 5 different lab projects. Prior to the first session of each lab project, students will perform a preliminary study to become familiar with the concepts that will be addressed in the lab. At the end of the last session of each lab project, students will answer individually a brief written assessment test.

Supervised assignments.

In this activity, the teacher will propose students to solve various practical tasks related to the content addressed in the course. Students will work as a team or individually, applying their knowledge to successfully solve practical cases raised. After the completion of the practical assignment, each student team shall issue a report with their results and make a public presentation and defense of it. Professors will periodically monitor the work progress and solve any questions raised by each team.

4.3. Syllabus

The topics for the lab projects in the previous year were as follows (there might be slight modifications for this course):

1. Sequence comparison and detection with Dynamic Time Warping
2. LPC speech coding
3. Introduction to neural networks for signal processing
4. Convolutional and recurrent neural networks for signal processing
5. ECG signal preprocessing and heart rate variability analysis

The general topic for the two supervised practical assignments is:

- Signal processing/communications app development in hardware with limited resources.
- Data analysis with Matlab or other software tools.

4.4. Course planning and calendar

The schedule of the course, for both the classroom sessions and the lab sessions, will be determined by the official academic calendar. Delivery deadlines of supervised practical assignments will be announced well in advance both in class and on the course website.

4.5. Bibliography and recommended resources

- Course webpage in moodle.unizar.es

http://biblos.unizar.es/br/br_citas.php?codigo=30357&year=2019