

60925 - Signal processing for communications

Información del Plan Docente

Academic Year	2017/18
Subject	60925 - Signal processing for communications
Faculty / School	110 - Escuela de Ingeniería y Arquitectura
Degree	533 - Master's Degree in Telecommunications Engineering
ECTS	5.0
Year	1
Semester	First semester
Subject Type	Compulsory
Module	---

1.General information

1.1.Introduction

1.2.Recommendations to take this course

1.3.Context and importance of this course in the degree

1.4.Activities and key dates

2.Learning goals

2.1.Learning goals

2.2.Importance of learning goals

3.Aims of the course and competences

3.1.Aims of the course

3.2.Competences

4.Assessment (1st and 2nd call)

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

5.Methodology, learning tasks, syllabus and resources

5.1.Methodological overview

The methodology followed in this course is oriented towards achievement of the learning objectives. A wide range of teaching and learning tasks are implemented, such as Lectures (M1), mini-projects (M4), practice sessions (M8), laboratory sessions (M9), tutorials (M10), and assessment (M11).

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Students are expected to participate actively in the class throughout the semester.

5.2.Learning tasks

The course includes the following learning tasks:

- **A01 Lectures** (38 hours). The teacher presents the theory and students participate actively. It takes place in the classroom. This methodology is designed to provide students with the theoretical foundations of the course and requires student autonomous work.
- **A02 Practice classes** (8 hours). The students solve problems to consolidate the theoretical concepts from the lectures. This activity will be conducted in the classroom.
- **A03 Lab sessions** (4 hours). There will be 2 sessions of 2 hours in the Signals and Systems Laboratory L2.02 (Ada Byron building). The students are provided with a series of problems to solve, which include the main topics of a digital communication system, and work on the lecture contents.
- **A05 Mini-projects** (22 hours). The students implement some of the theoretical concepts of the course using a simulation environment provided by the teacher. Students will write a report and make an oral presentation.
- **A06 Tutorials**. The teacher answers questions of the students in the office with the aim of reviewing and discussing the materials and topics presented in lectures and practice sessions.
- **A08 Assessment**. The evaluation is done using the lab reports, projects and written tests described in the "Assessment" section.

5.3.Syllabus

The course will address the following topics:

- Topic 1. Review of Wiener filtering and adaptive filtering. Adaptive equalization
- Topic 2. Multichannel adaptive processing. Array Processing.
- Topic 3. MIMO Systems ("Multiple Input Multiple Output"). Fundamentals and Applications.
- Topic 4. Signal processing in multimedia communication systems.

5.4.Course planning and calendar

Further information concerning the timetable, classroom, office hours, assessment dates and other details regarding this course, will be provided on the first day of class or please refer to the EINA website.

5.5.Bibliography and recommended resources

BB	Bossi, M.. Introduction to digital audio coding and standards / M. Bossi, R.E. Goldberg Kluwer academic publishers, 2003.
BB	Haykin, Simon Saher. Adaptive filter theory / Simon Haykin . 4th ed. Upper Saddle River, New Jersey : Prentice Hall, cop. 2002
BB	Kuo, Franklin. Multimedia Communications. Protocols and Applications / Franklin Kuo, Wolfgang Effelsberg, J.J. Garcia-Luna-Aceves Prentice Hall, 1998.
BB	Manolakis, Dimitris G.. Statistical and adaptive signal processing : spectral estimation, signal modeling, adaptive filtering and array processing / Dimitris G.

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- BB** Manolakis, Vinay K. Ingle, Stephen M.
Kogon Boston [etc.] : McGraw Hill, 2000
Paulraj, Arogyaswami. Introduction to
space-time wireless communications /
Arogyaswami Paulraj, Rohit Nabar,
Dhananjay Gore . - 1st pub, repr. with corr.
Cambridge [etc.] : Cambridge University
Press, 2008
- BB** Widrow, Bernard. Adaptive signal
processing / Bernard Widrow, Samuel D.
Stearns Englewood Cliffs : Prentice-Hall,
cop. 1985