

Academic Year: (2024 / 2025)

Review date: 24-04-2024

Department assigned to the subject: Signal and Communications Theory Department

Coordinating teacher: RAMIREZ GARCIA, DAVID

Type: Additional training ECTS Credits : 2.0

Year : 0 Semester : 1

REQUIREMENTS (SUBJECTS THAT ARE ASSUMED TO BE KNOWN)

The student should have basic knowledge of

- probability theory and statistics
- linear algebra.

OBJECTIVES

The main objective of this course is that the student acquires the basic knowledge/tools to be able to complete Statistical Signal Processing

DESCRIPTION OF CONTENTS: PROGRAMME

Probability theory: introduction, random variables, probability distribution and density functions, mathematical expectation and moments.

Stochastic processes: introduction, first- and second-order statistics, stationarity and power spectral density

Linear algebra: introduction, matrix algebra and matrix decompositions

LEARNING ACTIVITIES AND METHODOLOGY

LEARNING ACTIVITIES

- AF3 Theoretical practical classes
- AF4 Laboratory practices
- AF5 Tutorials
- AF6 Team work
- AF7 Student individual work
- AF8 Partial and final exams

METHODOLOGY

MD1: Class lectures by the professor with the support of computer and audiovisual media, in which the main concepts of the course are developed and complemented with bibliography.

MD2: Critical reading of texts recommended by the professor of the course.

MD3: Resolution of practical cases, problems, etc. posed by the teacher individually or in groups.

MD4: Presentation and discussion in class, under the moderation of the professor, of topics related to the content of the course, as well as case studies.

MD5: Elaboration of works and reports individually or in groups.

CONSULTATION HOURS

The students will be able to consult with the instructor during 2 or 3 hours per week

ASSESSMENT SYSTEM

% end-of-term-examination:	0
% of continuous assessment (assignments, laboratory, practicals...):	100
SE1	Participation in class
SE2	Individual or team works made during the course (including mid-term exams)
SE3	Final exam

Evaluation systems (%)	Minimum weighting (%)	Maximum Weighting
SE1	0	0
SE2	100	100
SE3	0	0

The extraordinary evaluation (june call) will be carried out with a final exam (SE3) that weights 100% of the grade.

BASIC BIBLIOGRAPHY

- A. Papoulis and S. Pillai Probability, Random Variables, and Stochastic Processes , McGraw-Hill, 2002
- D. Ramírez, I. Santamaría, and L. Scharf Coherence: In Signal Processing and Machine Learning, Springer, 2023