

Academic Year: ( 2023 / 2024 )

Review date: 13/04/2023 12:59:30

Department assigned to the subject: Signal and Communications Theory Department

Coordinating teacher: RAMIREZ GARCIA, DAVID

Type: Compulsory ECTS Credits : 3.0

Year : 3 Semester : 1

## REQUIREMENTS (SUBJECTS THAT ARE ASSUMED TO BE KNOWN)

Signals and Systems (Second year, first semester)

## OBJECTIVES

Knowledge and management of the different techniques of digital communications, the structure of receivers and the basic techniques for protection against errors in digital communications.

Therefore, the objectives of this course are:

- Acquisition of the knowledge of mathematics and statistics that will be used as a tool to solve engineering problems in the context of digital communication systems.
- Design of a communication system with realistic constraints given by critical parameters such as cost, consume of power, bandwidth, transmission rate, and complexity.

## DESCRIPTION OF CONTENTS: PROGRAMME

1. Signals and noise
  - a. Stochastic processes and their characterization
  - b. Wide sense stationary processes
  - c. Noise models.
2. Digital transmission systems
  - a. Overview and functional blocks
  - b. Digital modulation and demodulation
  - c. Gaussian channels
  - d. Optimal detection and matched filters
  - e. Error rates.
3. Channel encoding and decoding
  - a. Types of channels
  - b. Channel codes
  - c. Channel capacity

## LEARNING ACTIVITIES AND METHODOLOGY

### THEORETICAL PRACTICAL CLASSES.

Knowledge and concepts students must acquire. Receive course notes and will have basic reference texts. Students partake in exercises to resolve practical problems.

### TUTORING SESSIONS.

Individualized attendance (individual tutoring) or in-group (group tutoring) for students with a teacher. Subjects with 6 credits have 4 hours of tutoring/ 100% on- site attendance.

### STUDENT INDIVIDUAL WORK OR GROUP WORK.

Subjects with 6 credits have 98 hours/0% on-site.

### WORKSHOPS AND LABORATORY SESSIONS.

Subjects with 3 credits have 4 hours with 100% on-site instruction. Subjects with 6 credits have 8 hours/100% on-site instruction.

#### ASSESSMENT SYSTEM

<b>% end-of-term-examination/test:</b>	60
<b>% of continuous assessment (assignments, laboratory, practicals...):</b>	40

##### FINAL EXAM.

Global assessment of knowledge, skills and capacities acquired throughout the course. The percentage of the evaluation varies for each subject between 60% and 0%.

##### CONTINUOUS EVALUATION.

Assesses papers, projects, class presentations, debates, exercises, internships and workshops throughout the course. The percentage of the evaluation varies for each subject between 40% and 100% of the final grade.

#### BASIC BIBLIOGRAPHY

- A. Artés, F. Pérez, J. Cid, R. López, C. Mosquera, F. Pérez. Comunicaciones Digitales, Pearson Educación, 2007