Communications theory

Academic Year: (2022 / 2023) **Review date: 20/06/2022 10:28:11**

Department assigned to the subject: Signal and Communications Theory Department

Coordinating teacher: VAZQUEZ LOPEZ, MANUEL ALBERTO

Type: Electives ECTS Credits : 6.0

Year : Semester :

DESCRIPTION OF CONTENTS: PROGRAMME

1.- Introduction
1.1.- Definition of a communication system
1.2.- Functional elements of a communication system
1.3.- Digital and analog communication systems
1.4.- Design of a communication systems
1.5.- Objectives and organization of the course
2.- Noise in communication systems
2.1.- Review: probability, random variables, and random processes
2.2.- Random processes in the frequency domain
2.3.- Statistical model for thermal noise
3.- Analog modulations
3.1.- Introduction to the modulation concept
3.2.- Amplitude modulations
3.3.- Angle modulations
3.4.- Effect of noise in analog modulations
4.- Modulation and detection in gaussian channels
4.1.- Introduction to digital communication systems
4.2.- Geommetric representation of signals
4.3.- Digital communication model
- Encoder
- Modulator
- Demodulator
- Detector
5.- Basic limits
5.1.- Probabilistic models for information sources
5.2.- Probabilistic models for channels
5.3.- Quantitative information measurements
5.4.- Channel capacity

LEARNING ACTIVITIES AND METHODOLOGY

AF1. THEORETICAL-PRACTICAL CLASSES. Knowledge and concepts students mustacquire. Receive course notes and will have basic reference texts.Students partake in exercises to resolve practical problems
AF2. 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.
AF3. STUDENT INDIVIDUAL WORK OR GROUP WORK.Subjects with 6 credits have 98 hours/0% on-site.
AF8. 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.
AF9. FINAL EXAM. Global assessment of knowledge, skills and capacities acquired throughout the course. It entails 4 hours/100% on-site
AF8. 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.

MD1. THEORY CLASS. Classroom presentations by the teacher with IT and audiovisual support in which the subject`s main concepts are developed, while providing material and bibliography to complement student learning
MD2. PRACTICAL CLASS. Resolution of practical cases and problem, posed by the teacher, and carried out individually or in a group
MD3. TUTORING SESSIONS. Individualized attendance (individual tutoring sessions) or in-group (group tutoring sessions) for students with teacher as tutor. Subjects with 6 credits have 4 hours of tutoring/100% on-site.
MD6. LABORATORY PRACTICAL SESSIONS. Applied/experimental learning/teaching in workshops and laboratories under the tutor's supervision.

ASSESSMENT SYSTEM

% end-of-term-examination/test:	60
% of continuous assessment (assigments, laboratory, practicals…):	40

SE1. 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%.
SE2. 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.