System Sensors

Academic Year: (2022 / 2023) **Review date: 18/05/2023 13:37:42**

Department assigned to the subject: Electronic Technology Department

Coordinating teacher: GARCIA CAMARA, BRAULIO

Type: Compulsory ECTS Credits : 3.0

Year : 3 Semester :

REQUIREMENTS (SUBJECTS THAT ARE ASSUMED TO BE KNOWN)

Subjects of Mathematics, Physics and Fundamentals of Electrical Engineering and Electronics.

OBJECTIVES

The objetives that the student is expected to acquire are the following:
- Demonstrate understanding of knowledge in the area of instrumentation systems.
- Demonstrate knowledge of the general principles associated with the measurement of physical magnitudes and instrumentation, as well as the different types of sensors and transducers most commonly used and their applications.
- Being able to specify, design and evaluate electronic and optoelectronic instrumentation systems for security applications.
- Have the ability to design and analyze energy conversion systems.
- Characterize basic electronic and photonic devices (LEDs, laser, F.O., etc.).
- Evaluate basic E/O communications systems.
- Have the ability to gather and interpret relevant data related to instrumentation systems.
- Apply their knowledge and demonstrate their skills by solving problems.
- Transmit information, ideas, problems and solutions, both orally and in writing, in relation to the topic of the subject, in a precise way.
- Demonstrate the ability to work in a team.
- Acquire the ability to organize and plan your work, making the right decisions based on available information, gathering and interpreting relevant data to make judgments within your area of study.
- Acquire the ability to engage in autonomous learning.

DESCRIPTION OF CONTENTS: PROGRAMME

- Introduction to instrumentation systems.
- Electronic circuits acquisition and signal conditioning
- Measurement of physical magnitudes of sensors
- Characterization of different types of sensors: temperature, position, optical, etc.

LEARNING ACTIVITIES AND METHODOLOGY

The teaching methodology will include:
- 40% (1.2 ECTS credits). Theoretical-practical classes where the knowledge that students must acquire will be presented. The students will have at their disposal the class notes and will have basic reference texts to facilitate the follow-up of the classes and the development of the subsequent work.
- 40% (1.2 ECTS credits. Problem classes, in which the problems proposed to the students are developed and discussed.
- 20% (0.6 ECTS credits. Laboratory practices where the student analyses, implements and measures characteristic parameters of electronic circuits of real application, using instrumentation and measurement techniques in the laboratory.
- Tutorials. Individual assistance (individual tutorials) or group (collective tutorials) to students by the teacher.
- Individual or group work of the student

ASSESSMENT SYSTEM

% end-of-term-examination/test:	50
% of continuous assessment (assigments, laboratory, practicals…):	50

The evaluation system includes:
- CONTINUOUS ASSESSMENT. In it, the Exercises, Works and Laboratory Practices will be valued.
- FINAL EXAM. In which the knowledge, skills and abilities acquired throughout the course will be assessed globally.

BASIC BIBLIOGRAPHY

- M.A. Perez García et al. Instrumentación electrónica, Ed. Thomson-Paraninfo, 2004

- Humphries J.T. Industrial Electronics, Delmar, 1993

- R. Pallás Areny, O. Casas Sensores y acondicionadores de señal, Mancorbo, 2003

ADDITIONAL BIBLIOGRAPHY

- Bannister B. R. Whitehead D.G. Instrumentación Transductores e Interfaz, Addison-Wesley Iberoamericana, 1994

- Pallás Areny R. Sensores y acondicionadores de señal: Problemas Resueltos, Marcombo, 2008