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New sensors in industrial, environmental and biomedical applications

Academic Year: (2022 / 2023)   **Review date:** 16-06-2021

Department assigned to the subject: Department of Electronic Technology

Coordinating teacher: LAMELA RIVERA, HORACIO

Type: Electives ECTS Credits : 3.0

Year : 1 Semester : 2

OBJECTIVES

COMPETENCES

To have and understand the knowledges to give the base and the opportunity to be original in the development and in the application of ideas, in general in the field or research.

To get that the students could apply the acquired knowledges and the ability to solve problems in the new environment and in the much more wide context (multidisciplinary context) related to the area of study.

To get as well that the students will be able to integrate the knowledges in order to fase the complexity of making judgements by having limited information and It includes as well reflections over social and ethical responsibilities related to the applications of their knowledges.

The students should know to communicate their conclusions and their knowledges based on strong arguments to present them to specialized and even no specialized audience, in a very clear and without ambiguity.

The students should have as well the ability to learn and to keep studying in a very continuous way.

To acquire the capabilities to understand the new technologies of electronic systems and Its adequate use and integration to solve new problems and new applications.
To acquire as well the capability to work in groups integrating different multidisciplinary approaches.
To include the scientific method as a fundamental tool of working to be applied in the professional and scientific fields.
The students should have the capability to solve practical problems coming from the interaction of the different elements within an electronic sensing system with external agents, by taking into account interference signals, electromagnetic compatibility or the termal management in the different steps of the design, prefabrication and redesign systems.

To know the state of the art of the actual and future techniques in the following fields: components, power subsystems, photonics, integrated circuits, photonic integrated circuits, microsystems, nanoelectronics, identification systems and systems applied to dependency.

Capacity to identify from a conceptual as well as practical point of view the scientific and technological challenges in the different applications of the electronic systems and Its integration and utility.

Capacity to make a useful search of information and to identify as well the state of the art of a technological problem in the field of electronic systems and Its application to the development of new sensors and new sensing systems.

LEARNING RESULTS

Upon passing this Subject the students should be able to identify from a conceptual point of view, but as well practical what are the main scientific and practical challenges in the different applications of the electronic systems as well as Its integration and utility. The proposed applications will be dynamic related to the technical state of the art in each moment, being as an example the proposal of this course on New Sensors in Industrial, Environmental and Biomedical Applications.

DESCRIPTION OF CONTENTS: PROGRAMME

1.-Introduction to New Sensing and Instrumentacion Systems.
2.-Characteristics, Performances and Specifications of Sensors and Transducers.
3.-Electrical, Optical, Optoelctronic and Spectral Caracteristics of the New Sesnors.
4.-Compensation of Influence Parameters to Obtain High Sensitive Physical Measurements in New Sensors.
5.-Signal Processing and Conditioning for New Sensors.
6.-Physical Integartion, Compact Characteristics and Enviroment Application of the New Sensors and New Sensing Systems.
7.-Measurements of Physical Magnitudes and Sensing Systems and Instrumentation in Industrial, Enviromental and Biomedical Applications

LEARNING ACTIVITIES AND METHODOLOGY

LEARNING ACTIVITIES
Theoretical classes.
Practical classes.
Theoretical and Practical classes.
Tutorials.
Student Work.

TEACHING METHODOLOGY
Lectures in the Professor´s class with computer and audiovisual resources, where the main concepts of the course will be developed and It will be giving as well the main bibliography to complement the learning process of the students.
Discussing lectures of the recommended bibliography by the Professor of the course as:
Press articles, research reports, academic and research papers to be used during the discussions of the classes in order to increase and consolidate the knowledges of the course.
Resolution of practical cases, problems, etc, proposed by the Professor in an individual or group way.
Preparation of a Work by the Students that will be related to the New Sensors and New Sensing Techniques to be applied in Industrial, Environmental and Biomedical Applications.

ASSESSMENT SYSTEM

-Continuos Evaluation: 100%

The assessment will be based on the following criteria:

o   Evaluation of the knowledges acquired by the Students through the realization of a Final New Sensors Work.

% end-of-term-examination: 0
% of continuous assessment (assigments, laboratory, practicals…):   100