

Academic Year: (2023 / 2024)

Review date: 28-04-2023

Department assigned to the subject: Electronic Technology Department

Coordinating teacher: GARCIA SOUTO, JOSE ANTONIO

Type: Electives ECTS Credits : 3.0

Year : 4 Semester :

REQUIREMENTS (SUBJECTS THAT ARE ASSUMED TO BE KNOWN)

Electronic Instrumentation

OBJECTIVES

1. A coherent knowledge of their branch of engineering including some at the forefront of the branch in electronic instrumentation.
2. The ability to apply their knowledge and understanding of electronic instrumentation to identify, formulate and solve engineering problems using established methods.
3. The ability to apply their knowledge and understanding to develop and realise designs to meet defined and specified requirements.
4. An understanding of design methodologies, and an ability to use them in the design of electronics instrumentation systems.
5. The ability to design and conduct appropriate experiments, interpret the data and draw conclusions.
6. Workshop and laboratory skills.
7. The ability to select and use appropriate equipment, tools and methods.
8. The ability to combine theory and practice to solve problems of electronic instrumentation.
9. An understanding of applicable techniques and methods in electronic instrumentation, and of their limitations.

DESCRIPTION OF CONTENTS: PROGRAMME

1. Virtual instrumentation and instrumentation software
 - 1.1. Development environment using LabVIEW
 - 1.2. Implementation of virtual instruments and modular applications
 - 1.3. Data structures and management of hardware resources
 - 1.4. Design of measurement processes
 - 1.5. User interface and input/output control
2. Electronic instrumentation project in the laboratory
 - 2.1 Data acquisition system (DAQ)
 - 2.2 Integration of sensors and instrumentation systems
 - 2.3 Data acquisition, presentation and control
 - 2.4 Calibration and measurements

LEARNING ACTIVITIES AND METHODOLOGY

The teaching methodology will include:

Lectures, where students will be introduced to the basic knowledge to be acquired. Students will be provided with lecture notes and will have basic reference texts that will allow them to complete and deepen their knowledge of the subject.

Practical classes oriented to the resolution of exercises and examples in the context of a real practical case. These classes will be complemented with the resolution of practical exercises by the student.

Laboratory practical sessions.

ASSESSMENT SYSTEM

1. Advanced virtual instrumentation designs.
2. Issues associated with the instrumentation system to develop in the laboratory.
3. Practical project in the laboratory with previous questions, set up of a system, measurements in the

laboratory and report with results and conclusions.

Ordinary call:

Continuous evaluation based on two assignments to answer in group of theoretical-practical content (40%), a team project including practical laboratory sessions (40%) and an individual test (20%).

Extraordinary call:

Based on continuous evaluation (50%) and final exam (50%). Optionally, it can be based on a single final exam (100%).

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

BASIC BIBLIOGRAPHY

- Clyde F.Coombs Jr.. Electronic Instrument Handbook, McGraw-Hill Professional, 2000
- M.A. Perez Garcia Instrumentacion Electronica, Paraninfo, 2014
- null LabVIEW Core 1 Course Manual, National Instruments Corporation, 2012
- null LabVIEW Core 2 Course Manual, National Instruments Corporation, 2012