Electronic Instrumentation II

Academic Year: (2019 / 2020) **Review date: 13-12-2019**

Department assigned to the subject: Electronic Technology Department

Coordinating teacher: MARTIN MATEOS, PEDRO

Type: Electives ECTS Credits : 6.0

Year : 4 Semester : 1

REQUIREMENTS (SUBJECTS THAT ARE ASSUMED TO BE KNOWN)

- Control Engineering
- Electronics Engineering Fundamentals
- Electronic Instrumentation

OBJECTIVES

By the end of this subject, students will be able to have:

1. Acquired the notions associated with the operation and design of electronic systems for industrial instrumentation.
2. The ability to apply their knowledge to analyze the design of various instrumentation system and different data acquisition architectures
3. The Ability of applying their knowledge and understanding to the development of instrumentation systems
4. The ability of designing and performing experiments, data analysis and draw conclusions
5. The ability of combining theoretical knowledge and practice to address engineering problems in the field of electronic instrumentation.
6. The ability of employing several methods for an effective communication with the engineering community and society in general

DESCRIPTION OF CONTENTS: PROGRAMME

1. Analogue processing chain of an instrumentation system:
1.1 Description of signals of the instrumentation systems.
1.2 Review of signal conditioning circuits
1.3 Noise and interference in instrumentation systems.

2. Data Acquisition Systems.
2.1 Integration of analog and digital signals in instrumentation systems:
2.2 Sampling and digital signal processing techniques.

3. Virtual Instrumentation: hardware and software. LabVIEW as reference software for the development of an instrumentation system
3.1 Tuning of the HW, management of resources of the HW
3.2 Implementation of virtual instruments
3.3 Development of modular applications
3.4 Design techniques, user interface and input / output control.

4. Laboratory project.

LEARNING ACTIVITIES AND METHODOLOGY

Lectures and practical classes in the computer room. In the latter students will see examples of the contents presented in the lectures, as well as LabVIEW basics.

Laboratory work. Guided practices in the electronics laboratory for electronics set-ups. Also, based on that set-up and specifications, students will realize a development project using data acquisition card and LabVIEW software design tool.

ASSESSMENT SYSTEM

Continuous evaluation based on work assignments (30%), development and documentation of the lab project (50%), and knowledge and skills tests (20%).

% end-of-term-examination:	20
% of continuous assessment (assigments, laboratory, practicals…):	80

BASIC BIBLIOGRAPHY

- M.A. Perez Garcia, J.C. Alvarez Anton, J.C. Campo rodriguez, G.J. Grillo Ortega Instrumentacion Electronica, Thomson Paraninfo, 2003
- null LabVIEW Core 1 Course Manual, National Instruments Corporation, 2012
- null LabVIEW Core 2 Course Manual, National Instruments Corporation, 2012