

Academic Year: (2018 / 2019)

Review date: 02-04-2018

Department assigned to the subject: Electronic Technology Department

Coordinating teacher: SANCHEZ REILLO, RAUL

Type: Electives ECTS Credits : 6.0

Year : 4 Semester :

REQUIREMENTS (SUBJECTS THAT ARE ASSUMED TO BE KNOWN)

No previous subject is expected to be completed

OBJECTIVES

The main target of this course is to provide the student with a global view about the majority of elements used as parts of Digital Electronic Systems. These include the different means for the Digital System to interact with the external world. With this knowledge, the student will be able to design and develop high performance Electronic Systems that will be used in whatever sector requested: Industrial Electronics, Consumer Electronics or Automatic Systems (such as robots).

Among the different interaction means that will be studied, there will be those based wired and wireless connections, plus those showing visual information.

The course will also teach the main concepts about advance architectures, such as DSPs, ASICs, System on Chip (SoC) or Embedded Systems. Furthermore, the different possibilities in continuing a R&D career in the field of Electronics Systems will be shown.

In order to take this course, there is no need to also take Microprocessors course. However, the joint study of Microprocessors, plus this subject, and the one called Digital Electronic Systems, will provide the student with high level capabilities for being employed in the different sectors requiring experts in the Electronics System Design, independently of the final application of the work to be done.

DESCRIPTION OF CONTENTS: PROGRAMME

1. Introduction
2. Connection through buses
 - 2.1. Concepts and architectures
 - 2.2. Historic evolution
 - 2.3. Comercial examples
 - 2.4. Exercises
3. Analog and Digital Conversion
 - 3.1. A/D Conversion
 - 3.2. D/A Conversion
 - 3.3. Exercises
4. Parallel communication
 - 4.1. Centronics
 - 4.2. GPIB
 - 4.3. Exercises
5. Synchronous serial communication
 - 5.1. I2C
 - 5.2. SPI
 - 5.3. Exercises
6. Asynchronous serial communication
 - 6.1. Basic concepts
 - 6.2. UART and RS-232
 - 6.3. RS-485

- 6.4. USB
- 6.5. Firewire
- 6.6. Modems and ADSL
- 6.7. Ethernet
- 6.8. Exercises

- 7. Wireless communication
 - 7.1. Fundamental concepts
 - 7.2. IrDA
 - 7.3. Bluetooth
 - 7.4. WiFi
 - 7.5. ZigBee
 - 7.6. RFID
 - 7.7. Exercises

- 8. Representation systems
 - 8.1. Printers and plotters
 - 8.2. LCD
 - 8.3. Screens
 - 8.4. Graphic cards
 - 8.5. Exercises

- 9. Electronic Systems Design
 - 9.1. Embedded Systems
 - 9.2. Development with mobile platform
 - 9.3. Exercises

- 10. R&D in Electronic Systems

LEARNING ACTIVITIES AND METHODOLOGY

- Lectures, conferences, seminars, individual assessment, personal homework of the student, etc. all of them oriented to the acquisition of theoretical knowledge (3 ECTS)
- Exercises, in-depth works, individual assessment and personal homework of the student in order to allow the student to put into practice the knowledge acquired (3 ECTS)

ASSESSMENT SYSTEM

Continuous evaluation based on 4 acumulative exams based on the general course:

- Exam 1 (10%): Parallel Communication and Buses.
- Exam 2 (20%): Serial and Wireless Communications.
- Exam 3 (20%): Representation, Storage and Conversion Systems.
- Exam 4 (40%): Electronic Systems Design.

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

BASIC BIBLIOGRAPHY

- MILLER, G.H. Microcomputer engineering, Prentice Hall, 1993
- RAFIQUZZAMAN, M. Microprocessors and Microcomputer-based system design, CRC Press, Inc., 1990

ADDITIONAL BIBLIOGRAPHY

- STALLINGS, W. Computer organization and architecture, Ed. McMillan Publishing Company, (3ª), 1993
- TANENBAUM, A.S. Organización de computadoras, un enfoque estructurado, Ed. Prentice-Hall (3ª), 1992