# Electronic system design

**Academic Year: ( 2020 / 2021 )** **Review date: 10-07-2020**

**Department assigned to the subject: Electronic Technology Department**

**Coordinating teacher: SANCHEZ REILLO, RAUL**

**Type: Electives ECTS Credits : 6.0**

**Year : 4 Semester : 1**

## REQUIREMENTS (SUBJECTS THAT ARE ASSUMED TO BE KNOWN)

No previous subject is expected to be completed

## OBJECTIVES

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

1. coherent knowledge of their branch of engineering including some at the forefront of the branch in electronic system design;
2. the ability to apply their knowledge and understanding of electronic systems 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.
5. workshop and laboratory skills.
6. the ability to select and use appropriate equipment, tools and methods;
7. the ability to combine theory and practice to solve problems of electronic system design;
8. an understanding of applicable techniques and methods in the design of electronic systems, and of their limitations;

## 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 (30%): Representation, Storage and Conversion Systems.
- Exam 4 (40%): Electronic Systems Design

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|---|---|
| **% 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

## BASIC ELECTRONIC RESOURCES

- Raúl Sánchez Reíllo . Transparencias de la Asignatura: http://AulaGlobal