

Academic Year: ( 2022 / 2023 )

Review date: 11-06-2021

Department assigned to the subject: Electronic Technology Department

Coordinating teacher:

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

<b>% end-of-term-examination:</b>	0
<b>% of continuous assessment (assigments, laboratory, practicals...):</b>	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>