

Academic Year: ( 2023 / 2024 )

Review date: 27-07-2023

Department assigned to the subject: Electronic Technology Department

Coordinating teacher: MARTIN MATEOS, PEDRO

Type: Compulsory ECTS Credits : 6.0

Year : 3 Semester : 1

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

Electronic Technology in Biomedicine

**OBJECTIVES**

Ability to analyze and conceptually design electronic devices that permit to solve problems in biology and medicine. Moreover, the student has to be able to select electronic devices to implement an electronic function. It will be especially emphasized that the student understands the possibilities offered by actual electronic technology, and the associated problematic in the development of new electronic technologies of interest in biology and medicine.

**DESCRIPTION OF CONTENTS: PROGRAMME**

Block 1: Analog Electronics for Biomedical Instrumentation

- Amplification
- Frequency Response
- Feedback Amplifiers

Block 2: Application Circuits for Biomedical Instrumentation

- Active Filters
- Oscillators and waveform generators.
- Sample&Hold Circuits. Sampling.
- A/D and D/A converters.

Block 3: Digital Systems for Biomedical Instrumentation

- Digital System basic scheme (Computer)
- Microprocessors. Arduino
- Measuring system integration in biomedical Engineering

**LEARNING ACTIVITIES AND METHODOLOGY**

- Theory classes (large group), problem resolutions classes (small groups), individual tutorials and student personal homework; oriented to theoretical knowledge acquisition.

- Laboratory practices and problems resolution classes in small groups, individual tutorials and student personal homework; oriented to practical knowledge related with the fields of the course.

- Computer sessions in small groups using CAD tools for electronics circuits¿ simulations. The goal of these sessions is to encourage the use of the CAD tools to complement the theoretical-practical learning during the course.

**ASSESSMENT SYSTEM**

The tests of first and second blocks in the continuing assesment are valued 30% of total mark. Lab exercises also are valued 20%. The final examination has a value of the remaining 50%. The last course block is evaluated together with the final examination. For the students not following continuing evaluation, the general rules of the university apply.

<b>% end-of-term-examination:</b>	50
<b>% of continuous assessment (assignments, laboratory, practicals...):</b>	50

#### BASIC BIBLIOGRAPHY

- Thomas L. Floyd Digital Fundamentals, Pearson Prentice Hall , 2009
- Thomas L. Floyd Principles of Electric Circuits, Pearson Prentice Hall , 2007
- Thomas L. Floyd Electronic Devices, Pearson Prentice Hall , 2008

#### ADDITIONAL BIBLIOGRAPHY

- null <https://www.arduino.cc/>, Arduino LLC.