Electronic engineering fundamentals

Academic Year: (2022 / 2023) **Review date: 10/06/2021 18:15:22**

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)

Pysics II, Solid state fundamentals for engineering, Electromagnetism and optics, Signals, systems and circuits.

OBJECTIVES

To know the fundamentals of electronic engineering, both analog and digital.
To know the fundamentals of active components in analog electronics and their use for amplification and other applications.
Knowledge of the fundamentals of electronic signal filtering.
Learning the fundamentals of power supply design.
To know the fundamentals of digital systems and microcontrollers.

DESCRIPTION OF CONTENTS: PROGRAMME

Introduction.
- Introduction to electronic engineering.
- Review of fundamental concepts (signals, systems, circuits and passive components).

Fundamentals of analog electronics:

Introduction to semiconductor-based devices.
- Introduction to the use of semiconductors in electronics.
- The diode.
- Circuits with diodes.

Active components. Amplification.
- Introduction to amplification and feedback.
- The bipolar junction transistor. Amplification.
- The MOSFET transistor. Amplification and applications.
- The operational amplifier. Comparators and amplifiers.

Electronic signal filtering.
- Review of frequency response.
- Design and implementation of passive and active filters.
- Filtering in electronic instrumentation

Electronic power supplies.
- Introduction to the design of power supplies.
- Basic topologies.

Fundamentals of digital electronics:

Fundamentals of Digital Systems:
- Binary digits, logic levels and digital waveforms
- Combinational and sequential logic functions: Basic arithmetic and logic functions. Storage functions. Counting function.

Introduction to microcontrollers:
- o Microprocessor architecture.
- o System architecture. Interrupts.
- o GPIOs.
- o Timers
- o Introduction to microcontroller programming

LEARNING ACTIVITIES AND METHODOLOGY

AF1. THEORETICAL-PRACTICAL CLASSES.
AF3. STUDENT INDIVIDUAL WORK OR GROUP WORK.
AF8. WORKSHOPS AND LABORATORY SESSIONS.
AF9. FINAL EXAM.
MD1. THEORY CLASS.
MD2. PRACTICAL CLASS.
MD6. LABORATORY PRACTICAL SESSIONS.

ASSESSMENT SYSTEM

% end-of-term-examination/test:	40
% of continuous assessment (assigments, laboratory, practicals…):	60

FINAL EXAM. In which the knowledge, skills and abilities acquired throughout the course will be assessed globally. The percentage of assessment will be 40%.

CONTINUOUS ASSESSMENT. It will include the laboratory sessions and two midterm exams. The percentage of assessment of each part will be as follows:
- ¿ 15% - Midterm exam 1
- ¿ 15% - Midterm exam 2
- ¿ 15% - Laboratory sessions
- ¿ 15% - Deliverable exercises on digital electronics

BASIC BIBLIOGRAPHY

- Thomas L Floyd Digital Fundamentals, Pearson.

- Thomas L. Floyd Electronic Devices, Prentice Hall.

- Thomas L. Floyd Principles of electric circuits, Prentice Hall.