Principles of computer engineering

Academic Year: (2019 / 2020) **Review date: 21/04/2020 15:14:35**

Department assigned to the subject: Computer Science and Engineering Department, Physics Department

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Type: Basic Core ECTS Credits : 6.0

Year : 1 Semester : 2

Branch of knowledge: Engineering and Architecture

REQUIREMENTS (SUBJECTS THAT ARE ASSUMED TO BE KNOWN)

Physics

OBJECTIVES

The objective of this course is that students know and understand circuits and basic components and the operation of a computer.
To achieve this objective the student must acquire a series of generic skills, knowledge, skills and attitudes.
CB1. Students have demonstrated knowledge and understanding in a study area of the base of general secondary education, and is typically at a level that, whilst supported by advanced textbooks, includes some aspects that will knowledge of the forefront of their field of study;
CB2:That students can apply their knowledge to their work or vocation in a professional manner and have competences typically demonstrated through devising and sustaining arguments and solving problems within their field of study;
CG2:Being able to generate new ideas (creativity) and anticipate new situations and adapt to Work in teams and interact with others, but also have ability to work independently.
CGB2:
Understanding and domain the basic concepts of fields and waves, electromagnetism, electrical circuit theory, electronic circuits, physical principles of semiconductors and logic families, electronic and photonic devices and their application to solving engineering problems themselves
This will have to achieve results in the areas of learning:
RA1: Knowledge and Compresnsión
RA4: Research
RA5: Applications

DESCRIPTION OF CONTENTS: PROGRAMME

1. Mathematical Tools in physics

-Field C the complex numbers.

-Binomial form of complex numbers.Graphical interpretation.

-Operations with complex numbers.

-Other ways to express a complex number.

- Equation´s system solution

2. DC. Basic components of a circuit of cc.

-Charge movements in metals.

-Law of Ohm. Resistivity and conductivity.

-Power dissipated in a conductor. Joule law

-Energy in a circuit. FEM.

-Basic DC circuit components: resistors and capacitors

-Basic circuits for DC. in steady state.

3. Solving DC circuits.

-Resistances in series and parallel. Equivalent circuits

-Rules of Kirchhoff: circuit of a single mesh.

-Rules of Kirchhoff: circuits varies, s mesh.

4 Techniques and tools of analysis of circuits

-Analysis of circuits:

- Superposition theorem
- Substitution theorem
- Millman's theorem
- Thevenin's theorem
- Norton's theorem,
- Design tools. Spice.Workbench

-Analog circuit design

5. Faraday induction law

-Magnetic flux through a circuit.

-Induced EMF and Faraday law.

-Sense of the current induced in a circuit. Lenz's law.

-Examples: fem induced variable magnetic fields at the time.

-Examples: fem of movement.

-A inductance in a circuit. Magnetic energy.

-Foucolt currents. Principle of operation of the thermal elements of induction.

6. Current variables at the time. Alternating current.

-Inductance as a circuit element.

- Capacitance in a circuit

-Current variables at the time. Loading and discharging of a capacitor in an RC circuit.

-Inductance as a circuit element. RL circuits.

-Alternating current generators.

-Alternating current in resistance. Frequency and phase. Power. Effective values.

7. Resolution of AC circuits.

-Alternating current in RL and RC circuits. Inductive and capacitive impedances.

-Series RLC circuit. Resonance. Power.

-Applications: Electronics, tuners, filters, etc.

-Ferromagnetic materials. The transformer.

-Circuits in parallel.

- Millman's theorem

- Thevenin's and Norton theorem

LEARNING ACTIVITIES AND METHODOLOGY

Were given theoretical lessons and practical exercises were conducted in the classroom.

Is propondran practical exercises,
Two partials test will be made which will form part of the continuous assessment note.

Are propondran topics of study in group must be present in public. This activity will be art of continuous assessment.

There will be a compulsory practice in the laboratory.

Be made a compulsory practice of simulation of circuits in computer tool. The tool will be presented to the students and will solve some exercises in class. A compulsory simulation exercise that will be part of the continuous assessment note will be raised.

There will be tutoring online and face-to-face weekly.

ASSESSMENT SYSTEM

% end-of-term-examination/test:	50
% of continuous assessment (assigments, laboratory, practicals…):	50

50% of the mark in final exam: have theoretical and problem solving. Minimum score for continuous assessment (3.5/10).

50% in continuous assessment distributed in the following way:

20% of ongoing evaluation exercises proposed in a partial test
10% of ongoing compulsory Faraday practice proposed and solved
20% of ongoing compulsory Pspice practice proposed and solved and test

50% of continuous evaluation in a practice of simulation and simplification of circuits. Simulation tool and practical simulation exercise. It is mandatory to carry out the Pspice practice and the Faraday practice to have the continuous assessment to be considered.

BASIC BIBLIOGRAPHY

- Tipler Mosca Fisica para la ciencia y la tecnologia, reverte, 2010