
Academic Year: (2019 / 2020)

Review date: 07-05-2019

Department assigned to the subject: Department of Electronic Technology

Coordinating teacher: FERNANDEZ HERRERO, CRISTINA

Type: Electives ECTS Credits : 6.0

Year : 4 Semester :

STUDENTS ARE EXPECTED TO HAVE COMPLETED

- Fundamentals of Electronic Engineering
- Analog Electronics I
- Digital Electronics

COMPETENCES AND SKILLS THAT WILL BE ACQUIRED AND LEARNING RESULTS.

- Understand the design cycle of an electronic product
- Know and use computer tools for electronic design
- Simulate electronic circuits
- Design printed board circuits
- Understand the effect of the physical design in the operation of an electronic circuit

DESCRIPTION OF CONTENTS: PROGRAMME

1. Introduction to CAD
 - 1.1. Introduction and history
 - 1.2. Virtual prototyping
 - 1.3. Design cycle
 - 1.4. Commercial CAD tools
2. Description of CAD tools for electronic circuits
 - 2.1. Schematic capture
 - 2.2. Lay-out editor
 - 2.3. Library manager
 - 2.4. Simulators
3. Schematics
 - 3.1. Basic rules
 - 3.2. Example of inverse engineering
4. Manufacturing PCBs
 - 4.1. Introductions
 - 4.2. Terminology
 - 4.3. Manufacturing processes
 - 4.3.1. Materials
 - 4.3.2. Methods
 - 4.3.3. Components assembly
 - 4.3.4. Soldering
5. Design of PCBs using CAD tools
 - 5.1. Parameters
 - 5.2. Placing components
 - 5.3. Routing the design
 - 5.4. Post-processing
 - 5.5. Design criteria
6. Simulation of electronic circuits
 - 6.1. Introduction
 - 6.2. Basic techniques
 - 6.3. Hierarchical design
 - 6.4. Subcircuits
 - 6.5. Behavioural library
 - 6.6. Digital and analog mixed simulation
 - 6.7. Simulator engine

LEARNING ACTIVITIES AND METHODOLOGY

- Lectures oriented to introduce Power Electronics concepts.
- Lectures oriented to problems resolution.
- Laboratory.

ASSESSMENT SYSTEM

- Laboratory (compulsory) (30%): design, simulation, PCB design and test of an electronic circuit.
- Tests during the course (30%): practical problems of simulation and PCB design.
- Final test (40%, minimum grade required): test about the basic concepts of the subject, and practical test about simulation and PCB design.

% end-of-term-examination: 40

% of continuous assessment (assignments, laboratory, practicals...): 60

BASIC BIBLIOGRAPHY

- Dennis Fitzpatrick Analog Design and Simulation Using OrCAD Capture and PSpice, Newnes, 2012
- Mark I. Montrose Printed Circuit Board Design Techniques for EMC Compliance, A Handbook for Designers, IEEE The Institute of Electrical and Electronics Engineers, 2000
- Muhammad H. Rashid Introduction to PSpice Using OrCAD for Circuits and Electronics, Prentice Hall, 2003

- Peter Wilson The Circuit Designer's Companion, Newnes, 2012

ADDITIONAL BIBLIOGRAPHY

- Kraig Mitzner Complete PCB Design Using OrCAD Capture and PCB Editor, Newnes, 2009