COURSE DATA

DATA SUBJECT

Code: 34951
Name: Ancillary techniques in industrial electronics
Cycle: Undergraduate Studies
ECTS Credits: 6
Academic year: 2025-26

STUDY (S)

Degree	Center	Acad. year	Period
1402 - Degree in Telecommunications Electronic Engineering	Escola Tècnica Superior d'Enginyeria	4	Second quarter
1404 - Degree in Industrial Electronic Engineering	Escola Tècnica Superior d'Enginyeria	4	Second quarter

SUBJECT-MATTER

Degree	Subject-matter	Character
1402 - Degree in Telecommunications Electronic Engineering	Optional subjects	ELECTIVES
1404 - Degree in Industrial Electronic Engineering	Optional subjects	ELECTIVES

COORDINATION

SANCHIS KILDERS ESTEBAN

SUMMARY

This subject is optional and is lectured in the fourth year of the Degree of Industrial Electronics Engineering. It has a load of 6 ECTS, which translates into a total workload for the student of 150 hours. 60 hours are in the classroom and 90 hours are individual work of the student. The 6 ECTS are all of lab work.

In this subject, students will learn special skills to design a complete Printed Circuit Board, starting with a correct schematics design and continuing with the proper design of the printed circuit board itself. An available software tool will be used, but the skills obtained can be applied to any software tool available in the market

Once the student passes this subject he will be able to design a complete Printed Circuit Board (PCB) following the whole process and complying with the specifications granted. Design criteria to improve electromagnetic compatibility will also be learned.

PREVIOUS KNOWLEDGE

RELATIONSHIP TO OTHER SUBJECTS OF THE SAME DEGREE

There are no specified enrollment restrictions with other subjects of the curriculum.

OTHER REQUIREMENTS

It is highly recommendable that the student has passed the subjects related to electronics belonging to the matter of Principles of Electronics and Electric Technology of the first and second year of the degree.

COMPETENCES / LEARNING OUTCOMES

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CO1 - More comprehensive skills than those acquired in compulsory subjects must be acquired in elective subjects.

DESCRIPTION OF CONTENTS

1. Introduction

1. General Information
2. Objectives
3. References
4. Contents
5. Evaluation

2. Electronic Circuit Design

1. Circuit Design
2. PCB Design
3. PCB Manufacturing
4. Test
5. Quality Control

3. Manufacturing

1. PWB Manufacture
2. Substrates

3. Conections
4. Structures
5. Tecnologies
6. Procedures

4. PWB Design with EDA tool

1. Workflow
2. Schematic Editor
3. Symbol Editor
4. Circuit drawing
5. PCB Editor
6. Footprint Editor
7. Placement and Routing
8. Error check, Gerbers and Final Documents

5. Lab Assignments

1. Laboratory Assignment 1
2. Laboratory Assignment 2
3. Laboratory Assignment 3
4. Laboratory Assignment extra

WORKLOAD

PRESENCIAL ACTIVITIES

Activity	Hours
Laboratory	60,00
Total hours	**60,00**

NON PRESENCIAL ACTIVITIES

Activity	Hours
Attendance at other activities	0,00
Individual or group project	0,00
Independent study and work	15,00
Preparation of lessons	60,00
Preparation for assessment activities	15,00
Resolution of case studies	0,00
Total hours	**90,00**

TEACHING METHODOLOGY

Teaching methodology will be based on practical learning. The student will have to design several complete PCB.

EVALUATION

Evaluation has two options.

The first option is a continuous evaluation through the whole quarter. The student will have to make three practical works (complete PCB designs) with a weight of 10% for LA1, 25% for LA2, 40% for LA3 and 25% for LAe on the 50% of the final mark of the subject. At the end of the quarter he will have a compulsory final exam (related to theory) with a weight of 50% of the mark.

The minimum mark for both parts is 5 over 10. Otherwise the student will fail the subject.

The student may use notes and books in the exam.

If the student fails the practical part he will have to do also a practical exam that will then weight the other 50%.

Attendance is compulsory and only 2 fails will be acceptable. Otherwise the student will have to make both exams to pass the subject.

In any case, the regulation established by the University of Valencia related to the evaluation process of Degrees and Master studies apply.

(https://webges.uv.es/uvTaeWeb/MuestraInformacionEdictoPublicoFrontAction.do?idEdictoSeleccionado=5639)

Copying or plagiarism of any activity that is part of the evaluation will result in the impossibility of passing the course, and the student will then be subject to the appropriate disciplinary procedures indicated in the ACTION PROTOCOL FOR FRAUDULENT PRACTICES AT THE UNIVERSITY OF VALENCIA (ACGUV 123/2020).

REFERENCES

- Printed Circuits Handbook, 7th Edition, Clyde Coombs, Happy Holden, McGraw-Hill Education
- KiCAD Documentation: docs.kicad-pcb.org
- IPC (2005): ¿IPC-7351 Generic Requirements for Surface Mount Design and Land Pattern Standard¿.