# Course guide
# 330251 - DEAD - Electronic Design Analog -Digital

**Last modified:** 28/04/2025

**Unit in charge:** Manresa School of Engineering
**Teaching unit:** 750 - EMIT - Department of Mining, Industrial and ICT Engineering.

**Degree:** BACHELOR'S DEGREE IN INDUSTRIAL ELECTRONICS AND AUTOMATIC CONTROL ENGINEERING (Syllabus 2009). (Optional subject).
BACHELOR'S DEGREE IN INDUSTRIAL ELECTRONICS AND AUTOMATIC CONTROL ENGINEERING (Syllabus 2016). (Optional subject).

**Academic year:** 2025 **ECTS Credits:** 6.0 **Languages:** Catalan, English

## LECTURER

**Coordinating lecturer:** RICARD SANAHUJA MOLINER

**Others:** JESÚS VICENTE RODRIGO - VICTOR BARCONS XIXONS

## DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

**Specific:**
1. The ability to define, analyze, design, evaluate and document both sequential and combinational digital circuits, as well as alternatives to their implementation, including CPLD and FPGA devices.
2. The ability to use tools and languages specification, synthesis and verification of digital circuits.
3. The knowledge and ability to use existing tools and instrumentation for the analysis, design, development and verification of electronic, computer and communications systems.

**Transversal:**
4. THIRD LANGUAGE. Learning a third language, preferably English, to a degree of oral and written fluency that fits in with the future needs of the graduates of each course.
5. EFFICIENT ORAL AND WRITTEN COMMUNICATION - Level 3. Communicating clearly and efficiently in oral and written presentations. Adapting to audiences and communication aims by using suitable strategies and means.
6. SELF-DIRECTED LEARNING - Level 3. Applying the knowledge gained in completing a task according to its relevance and importance. Deciding how to carry out a task, the amount of time to be devoted to it and the most suitable information sources.

## TEACHING METHODOLOGY

## LEARNING OBJECTIVES OF THE SUBJECT

## STUDY LOAD

| Type | Hours | Percentage |
|---|---|---|
| Hours small group | 30,0 | 20.00 |
| Self study | 90,0 | 60.00 |
| Hours large group | 30,0 | 20.00 |

**Total learning time:** 150 h

## CONTENTS

### (ENG) 1. INTRODUCCIÓ

**Full-or-part-time:** 8h
Theory classes: 2h
Practical classes: 2h
Self study : 4h

### (ENG) 2. DISPOSITIUS PROGRAMABLES DIGITALS I ANALÒGICS, I LA SEVA CONNNEXIÓ

**Full-or-part-time:** 104h
Theory classes: 22h
Practical classes: 22h
Self study : 60h

### (ENG) 3. DISSENY DE PLAQUES DE CIRCUIT IMPRÉS

**Full-or-part-time:** 38h
Theory classes: 6h
Practical classes: 6h
Self study : 26h

## ACTIVITIES

### (ENG) TÍTOL DE L'ACTIVITAT 1: CLASSES MAGISTRALS I PARTICIPATIVES

**Full-or-part-time:** 25h
Theory classes: 25h

### (ENG) TÍTOL DE L'ACTIVITAT 2: CLASSES DE LABORATORI

**Full-or-part-time:** 75h
Practical classes: 30h
Self study: 45h

### (ENG) TÍTOL DE L'ACTIVITAT 3: TREBALL PERSONAL INDIVIDUAL/EN GRUP

**Full-or-part-time:** 20h
Self study: 20h

### (ENG) TÍTOL DE L'ACTIVITAT 4: PROVES

**Full-or-part-time:** 30h
Theory classes: 5h
Self study: 25h

## GRADING SYSTEM

## BIBLIOGRAPHY

**Basic:**
- Ashenden, Peter J. Digital design : an embedded systems approach using VHDL [on line]. Burlington, MA: Morgan Kaufmann Publishers, 2007 [Consultation: 31/05/2022]. Available on: https://ebookcentral-proquest-com.recursos.biblioteca.upc.edu/lib/upcatalunya-ebooks/detail.action?docID=858615. ISBN 9780123695284.
- Torres, Manuel. Diseño e ingenieria electronica asistida por ordenador en Protel. Madrid: Ed: Ra-Ma, 1999. ISBN 9788478973408.