



Universitat de Lleida

DEGREE CURRICULUM
DIGITAL ELECTRONICS

Academic year 2013-14

Subject's general information

Subject name	Digital Electronics
Code	102120
Semester	1r Q Avaluació Continuada
Typology	Obligatòria
ECTS credits	6
Theoretical credits	0
Practical credits	0
Department	Informàtica i Enginyeria Industrial
Important information on data processing	Consult this link for more information.
Language	Català

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Learning objectives

see competences

Competences

Degree-specific competences

- Applied knowledge of high-power electronics.
- Knowledge of the principles and applications of analogical electronics.
- Knowledge of the principles and applications of digital electronics and microprocessors.

Goals

- Learning basic digital devices.
 - Establishing operation mechanisms of digital circuits.
 - Understanding the applicability of digital circuits in the development of control circuitry and microprocessors.
- Applied knowledge of electronic instrumentation.

Degree-transversal competences

- Ability to resolve problems and elaborate and defend arguments inside their field of study.

Goals

- Proposing digital circuits able to solve specific problems, meeting constraints related to minimization and availability of devices.
- Ability to analyse and synthesize.

Goals

- Analysis of the behaviour of a specific digital circuit and deduction of the implemented logic functions.
- Given a specific situation to be solved with a digital circuit, find out the minimum circuit that responds for this solution.

Subject contents

Chapter 1. Binary codes

1.1. Number systems

1.2. Binary arithmetic.

1.3. Representation of signed number.

Chapter 2. Logic functions

- 2.1. Switching algebra
- 2.2. Canonical representation of functions.
- 2.3. Incompletely specified functions
- 2.4. Simplification methods
- 2.5. Multifunctional simplification.

Chapter 3. Combinational circuits

- 3.1. Pulse and level signals.
- 3.2. Logic gates.
- 3.3. Positive and negative logic.
- 3.4. Two gate level circuits.
- 3.5. Analysis and design of combinational circuits.
- 3.6. Combinational systems.
 - Multiplexed/ Demultiplexer
 - Encoder/ Decoder
 - Comparators
 - One bit adder/ subtractor
 - N bits adder

Chapter 4. Sequential circuits

- 4.1. Basic memory cell
- 4.2. Flip-flops
- 4.3. Synchronism
- 4.4. Analysis and design of sequential circuits
- 4.5. Design of synchronous sequential circuits.
- 4.6. Counters
- 4.7. Registers

Chapter 5. Memories and programmable logic devices.

- 5.1. ROM Memory
- 5.2. Combinational PLD
- 5.3. Sequential PLD

Evaluation

Without translate-

N_P1: nota examen primer parcial.

N_P2: nota examen segon parcial.

N_Pr: nota de pràctiques

La nota de l'assignatura es calcula aplicant els següents percentatges:

$$\text{NOTA_FINAL} = 20\% \text{ N_P1} + 50\% \text{ N_P2} + 30\% \text{ N_Pr}$$

Per tenir superada l'assignatura cal que NOTA_FINAL sigui major o igual que 5.

En cas de no haver superat l'assignatura, es pot anar a l'examen de recuperació. En aquest cas la nota es calcularà de la següent manera:

N_rec: nota de l'examen de recuperació.

$$\text{NOTA_FINAL} = 70\% \text{ N_rec} + 30\% \text{ N_Pr}$$

Bibliography

- Lloris A., Prieto A., Parrilla L. *Sistemas digitales*. McGraw-Hill.
- Gajski D. D. *Principios de Diseño Digital*. Prentice-Hall.
- García Zubía J. *Problemas resueltos de electrónica digital*. Thomson.
- Marcovitz A. *Introduction to logic design*. McGraw-Hill.