

Electronics Digital

1. DESCRIPTORI

- 1.1 SSD: ING-INF/01
- 1.2 Credits: 6
- 1.3 Teacher: Mauro Olivieri
- 1.4 Contact teacher: 06 44585435, olivieri@diet.uniroma1.it
- 1.5 Scheduling: first semester
- 1.6 Offered to: BELR
- 1.7 Evaluation type: exam with grading in thirties
- 1.8 Reference academic years: 2013/2014

Objectives:

ITA:

The course aims to introduce the student to the analysis and design of digital systems. At the end of the course the student will know the essential concepts of digital electronics, will know the scenario of methodologies and realization alternatives, will be able to understand the technical documentation of digital systems and components, will be able to set up and solve simple problems of analysis or design of digital circuits and systems.

ENG:

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Prerequisites:

Elementary concepts of logic, analog electronics, electrotechnics.

Programma:

ITA:

Role of digital electronics. Activities of the digital designer: specification, design, synthesis, verification, documentation.

Basic circuits, methods and components. Signals and logic variables, Boolean algebra, truth tables and canonical forms of logic functions. Basic logic gates and De Morgan's Theorem. Combinatorial and sequential digital functions, overview of several methods used for combinatorial synthesis. Basic combinatorial and sequential digital components.

Circuit-level implementation. Review of the on-off properties of MOSFET and BJT transistors. CMOS and ECL logic families. Static behavior, dynamic behavior, power consumption. Notes on other logic families. Development of one or more case studies on digital components design.

Digital electronic systems and their implementation. The microprocessor, functions, components and basic hardware structure. Types of microprocessors. Framework and implementation of a microprocessor-based system. CPU connection with memory and I/O devices.

ENG:

The role of Digital Electronics. Activities of a digital designer: specification, design, synthesis, implementation, verification, documentation.

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Didactic material

- Libro di testo: M. Olivieri, Elementi di Progettazione dei Sistemi VLSI. Volume I: Introduzione all'Elettronica Digitale. EDISES, Napoli. Documento di errata corrige:
http://vlsi.die.uniroma1.it/Errata_Corrige_VLSI_Volume_2.pdf
- Raccolte di documentazione ed articoli scientifici distribuite durante il corso.

5. SITO WEB DI RIFERIMENTO

<http://vlsi.die.uniroma1.it>