Politecnico di Torino

Academic Year 2010/11 (first time established in A.Y.2007/08)

01MERJA

Electronics II

1st degree and Bachelor-level of the Bologna process in Electronic And Computer Engineering - Vercelli (III FACOLTA' DI INGEGNERIA)

Teacher	Status	SSD	Les	Ex	Lab	Years Stability
Masera Guido	AC	ING-INF/01	4	1	1	2

SSD	CFU	Activities	Area context
ING-INF/01	6	B - Caratterizzanti	Ingegneria elettronica

Objectives of the course

The course will provide the basic knowledge related to the design and analysis of digital circuits and systems, as well as basics on analog to digital and digital to analog. Theory, methodology and design aspects will be covered.

Expected skills

At the end of the course, the student will know the main issues related to digital circuits and conversion systems; he will also be able to design simple digital circuits, exploiting proper CAD tools for the simulation, synthesis and verification.

Prerequisites

The course requires a basic knowledge of circuit analysis, electronic technology and electronic devices.

Syllabus

Logic Families.
- Types of Logic Family.
- Transistor Transistor Logic (TTL).
- Advanced bipolar families
- CMOS Logic Family.
- BiCMOS Logic.
- Interfacing with Different Logic Families.

Combinational Circuits.
- Multiplexer
- Encoders
- Demultiplexers and Decoders.
- Arithmetic Circuits ' Basic Building Blocks.
- Adder'Subtractor.
- Multipliers.

Sequential Circuits.
- Latches and Flip Flops
- Synchronous and asynchronous counters
- Shift registers
- Finite state Machines
- Multivibrator

Programmable Logic Devices.
- Fixed Logic Versus Programmable Logic.
- Programmable Logic Devices ' An Overview.
- PAL Architecture.
- Complex Programmable Logic Devices.
- Field'programmable Gate Arrays.
- Programmable Interconnect Technologies.
- Design and Development of Programmable Logic Hardware.

Data conversion circuits
- Digital to analog conversion
- Analog to digital conversion
- Sample and hold circuits
- General architecture of a conversion system

Laboratories and/or exercises

Numerical exercises will help understanding analysis and design methods; Laboratory assignments will imply the use of CAD tools for the design and simulation of digital circuits.

Bibliography

Bibliografy:
o Slides will be made available on CD-ROM and course web-pages
o Anil Kumar Maini, Digital Electronics: Principles, Devices and Applications, John Wiley and Sons, 2007, ISBN0470032146, 9780470032145, 727 pages

Revisions / Exam

Written examination including numerical problems and questions covering the whole course contents. Reports written by students during laboratory activities will also be evaluated. Optional oral exam.

Programma definitivo per l'A.A.2010/11

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