EE-330

Digital IC design

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Cursus	Sem.	Type
Communication systems	BA6	Opt.
Computer science	BA6	Opt.
Electrical and Electronical Engineering	BA6	Opt.
HES - EL	E	Obl.

Language of teaching	English
Credits	3
Session	Summer
Semester	Spring
Exam	Written
Workload	90h
Weeks	14
Hours	**3 weekly**
Courses	2 weekly
Exercises	1 weekly
Number of positions	

Summary

Digital IC Design presents the fundamentals of digital integrated circuit design. The methods and techniques aiming at the fabrication and development of digital integrated circuits are reviewed, the major design style pertaining to digital logic and memory are presented.

Content

Logic design
Process technology and integration
Layout and design rules
Physical design
Delay and power
Interconnects
Static logic
Dynamic logic
Sequential logic
Subsystems (logic, arithmetic)
Memory

Keywords

Digital logic, integrated circuit, VLSI

Learning Prerequisites

Required courses

EE-207 Systèmes logiques (introduction to digital logic), or
EE-110 Systèmes logiques (Introduction to digital logic)

Recommended courses

EE-202 IC Electronique I (introduction to electronics)
EE-208 Microcontrollers and digital systems, or
MICRO-210 Microcontrollers

Learning Outcomes

By the end of the course, the student must be able to:

- Design components of digital integrated circuits
- Decide various transistor-level design options
- Analyze the operation of relevant digital ICs
- Explain fabrication and conception techniques of ICs

Transversal skills

- Assess one's own level of skill acquisition, and plan their on-going learning goals.

Teaching methods

Class lectures and exercises

Assessment methods

Written exam

Resources

Bibliography

Introduction to VLSI Systems: A Logic, Circuit, and System Perspective, M.-B. Lin, CRC Press, 2012

Ressources en bibliothèque

- Introduction to VLSI Systems: A Logic, Circuit, and System Perspective, M.-B. Lin, CRC Press, 2012

Moodle Link

- https://go.epfl.ch/EE-330