

EE-330

Digital IC design

Schmid Alexandre

Cursus	Sem.	Type
Electrical and Electronical Engineering	BA6	Opt.
HES - EL	E	Obl.

Language	English
Credits	3
Session	Summer
Semester	Spring
Exam	Written
Workload	90h
Weeks	14
Hours	3 weekly
Lecture	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-102 Systèmes logiques (introduction to digital logic), or
 EE-110 Systèmes logiques (Introduction to digital logic)

Recommended courses

EE-320 IC Design I (introduction to analog integrated circuits)
 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

Moodle Link

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