

EE-330

**Digital IC design**

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Cursus	Sem.	Type
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
<b>Hours</b>	<b>3 weekly</b>
Lecture	2 weekly
Exercises	1 weekly
<b>Number of positions</b>	

**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

#### **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>