EPFL

EE-429	**Fundamentals of VLSI design**

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Cursus	Sem.	Type
Cyber security minor	H	Opt.
Cybersecurity	MA1, MA3	Opt.
Electrical and Electronical Engineering	MA1, MA3	Opt.
MNIS	MA3	Obl.

Language of teaching	English
Credits	4
Session	Winter
Semester	Fall
Exam	During the semester
Workload	120h
Weeks	14
Hours	**4 weekly**
Courses	3 weekly
Exercises	1 weekly
Number of positions	

Summary

The course introduces the fundamentals of digital integrated circuits and the technology aspects from a designers perspective. It focuses mostly on transistor level, but discusses also the extension to large digital semicustom designs.

Learning Prerequisites

Required courses

EE-490(b) Lab in EDA based design (can be attended in parallel in same semester)

Learning Outcomes

By the end of the course, the student must be able to:
- Construct digital logic gates
- Analyze the performance of digital gates
- Optimize digital logic
- Explain the operation of embedded memories
- Anticipate the impact of parasitics and technology scaling
- Implement a semicustom integrated circuit from a given RTL code to layout
- Link simplified abstract models to detailed computer simulations

Teaching methods

Ex-cathedra lectures with computer labs using industry-standard IC design tools

Prerequisite for

EE-431 Advanced VLSI design (highly recommended)