

# Integrated circuit design



ECTS  
7 credits



Component  
INSTITUT  
NATIONAL  
DES SCIENCES  
APPLIQUEES  
TOULOUSE



Number of  
hours  
104h

## Presentation

### Description

Programme (detailed contents):

- \* Starting from a real industrial application, the students will specify an embedded electronic system.
- \* Using the previous specification, the students will design the system on chip and realize the software/hardware partitioning.
- \* The students will design HW system architecture (digital and analog blocks, interfaces, power sources) taking into account the performances of the system (robustness, power consumption, frequency). The validation will be done by simulation and integrated circuit implementation (IP block).

Organization:

- \* Courses and labs
- \* Project based learning
- \* Link with English courses. The final report and the oral presentation are given in English.

## Objectives

At the end of this module, the student will have understood and be able to explain (main concepts):

- \* MOS characteristics
- \* CMOS analog and digital function performances (consumption, efficiency, Signal-to-noise ratio, operating frequency, ...)
- \* The different simulation modes to characterize analog and digital circuits performances
- \* Design and optimization of advanced integrated systems
- \* Co-design of SW/HW complex systems

The student will be able to:

- \* Specify an advanced electronic system including digital, analog, RF circuits and interfaces
- \* Set up a design methodology (computer aided design) to respond to a specification
- \* Design full custom CMOS circuits basis (IP blocks) of SoC.
- \* Simulate CMOS circuits performances with professional tools (Cadence)

## Useful info

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### Place

➤ Toulouse