

Hardware Computing and microelectronics



ECTS
5 crédits



Hourly volume
57h

Introducing

Objectives

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

- The concepts of combinational and sequential logic systems.
- The concepts of synchronous and asynchronous logic systems (or circuits).
- The design methods of logical systems and their implementation.
- The different computer architecture models, standard computer components and their role,
- The information coding.
- The link between the hardware architecture and the Operating System,
- The processor micro-architecture and the standard hardware optimization techniques.

The student will be able to:

- Represent and minimize logic functions.
- Design a combinational or sequential logical system.
- Extract from a diagram the architecture model, cite the different hardware components, and deduce the application domain of such architecture.
- Study the memory hierarchy in order to evaluate performance in the case of simple examples,
- Explain from a case study, the different components used, their role and the scheduling of operations,

-Describe the basics of semi-conductor physics and the physical and chemical processes in microelectronics.

-Simulate, manufacture (in cleanroom) and electrically test an elementary component, such as a PN junction and a photovoltaic cell.

Necessary prerequisites

- Fundamentals of electricity, Kirchhoff's laws, basic theorems;
- No necessary knowledge. The lessons (ITEI) have to be done before the lab-work.

Practical info

Location(s)

Toulouse