SYSTÈMES ÉLECTRONIQUES

ELECTRONIC SYSTEMS

Lecturers: Ian O CONNOR, Alberto BOSIO

| Lecturers : 14.0 | TC : 14.0 | PW : 6.0 | Autonomy : 2.0 | Study : 0.0 | Project : 0.0 | Language : FR

Objectives

The evolution of electronic systems is linked to Moore's Law according to which the complexity of integrated circuits doubles every eighteen months. In order to be able to grasp the complexity of current systems and understand their evolution, it is necessary to know the basics of electronic technology.
The objective of the "Electronic systems" course is therefore to provide the engineering student with the scientific and technological bases necessary for the understanding of the functioning of electronic systems and their evolution as well as for the design of complex systems composed of circuits for processing information represented as analog as well as digital signals.

Keywords : PN junction, CMOS transistor, analog circuits, digital circuits, processors.

Programme

- Introduction to electronics
- MOS transistor
- High frequency modelling, presentation of the CMOS amplifier
- Detailed study of the MOS inverter
- Digital circuits, combinatorial logic. Boolean algebra and Karnaugh tables. Digital circuits, sequential logic
- Microprocessor architecture

Learning outcomes

- Be able to understand the scope of the field of electronics: from device to processor.
- To be able to describe the evolution of microelectronic systems.
- Know how to identify circuit design methods and techniques.

Independent study

Objectifs : Learn more about the topics covered in tutorials (TD).

Méhodes : Perform electrical simulations with a reference simulator (LTSPICE) to analyse the operation of devices and circuits.

Core texts

Rousseau Eric, *PSPICE : MÉTHODOLOGIE D'UTILISATION ET TECHNIQUES AVANCÉES*, DL, 2007
Dusausay Serge *COMPRENDRE L'ÉLECTRONIQUE PAR LA SIMULATION : 43 CIRCUITS SIMULÉS & RAPPELS DE COURS*, DL, 2000
Poitevin Jean-Marc*ÉLECTRONIQUE ANALOGIQUE ET NUMÉRIQUE : AIDE-MÉMOIRE* , DL, 2008

Assessment

Score = 90% "savoir" + 10% "savoir-faire" ("savoir" score = final test of 2 hours without document / "savoir-faire"score = 50% TP1 report + 50% TP2 report).