ELEC2650 Analog integrated circuits

[30h+30h exercises] 5 credits

This course is taught in the 1st semester

Teacher(s): Denis Flandre
Language: French
Level: Second cycle

Aims

The design of analog integrated systems and of mixed analog-digital type in application in instrumentation, telecommunication, signal processing ... is based on in-depth knowledge of electronics devices and circuits. This course aims at presenting the state-of-the art (architectural solutions, performances and limitations) and at providing an advanced design methodology.

Main themes

Identical to the contents of the course

Content and teaching methods

1. Analog modelling of the MOS transistor
2. Operational and transconductance amplifiers
3. Switched-capacitor filters
4. Continuous-time filters
5. Switched-current circuits
6. D-A, A-D converters (incl. Sigma-Delta)

The details of the internal achitecture and of the operation of analog CMOS basic blocks and circuits are studied in the cases of actual integrated systems. Design and optimisation strategies are derived in order to achieve the performance specifications of target applications.
Advanced computer-aided analysis and synthesis techniques are introduced. Practical case studies are presented or implemented in the frame of exercice sessions.

Other information (prerequisite, evaluation (assessment methods), course materials recommended readings, ...)

Basic electronics course
Practical sessions mainly consists in computer-based implementations of the course optimal design strategies for cases of study under consideration and include the learning and use of standard CAD tools such as MATLAB, SPICE (ELDO), Cadence ...
Assessment :
Presentation of a work at the end of the semester.

Programmes in which this activity is taught

FSA3DS Diplôme d'études spécialisées en sciences appliquées

Other credits in programs

ELEC23	Troisième année du programme conduisant au grade d'ingénieur civil électricien	(5 credits)
ELME23/M	Troisième année du programme conduisant au grade d'ingénieur civil électro-mécanicien (mécatronique)	(5 credits)
FSA3DA	Diplôme d'études approfondies en sciences appliquées	(5 credits)