UCL Faculté des sciences appliquées

FSA

ELEC2650   ANALOG INTEGRATED CIRCUITS

[30h+30h exercises] 5 credits

This course is taught in the 1st semester

Teacher(s):   Denis Flandre
Language: french
Level: 2nd cycle course

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.

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.

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)