

MICRO-705

**Low-voltage analog CMOS IC design**

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Cursus	Sem.	Type
Electrical Engineering		Opt.
Microsystems and Microelectronics		Opt.

Language of teaching	English
Credits	2
Session	
Exam	Written & Oral
Workload	60h
<b>Hours</b>	<b>32</b>
Courses	32
<b>Number of positions</b>	

**Remark**

Cours supprimé du plan d'études EDMI et EDEE

**Summary**

The course is covering following aspects: MOS Transistor Modeling for Low-Voltage and Low-Power Circuit Design, Noise Performance of Elementary Transistor Stages, Stability of Operational Amplifiers, Important Opamp Configurations and Distortion in Elementary Transistor Circuits.

**Content****Day 1:**

- MOS Transistor Modeling for Low-Voltage and Low-Power Circuit Design
- Basic Low-Power, Low-Voltage Circuit Techniques
- Differential Amplifying Blocks with Positive Feedback

**Day 2:**

- Noise Performance of Elementary Transistor Stages
- Stability of Operational Amplifiers
- Systematic Design of Low-Power Operational Amplifiers
- Important Opamp Configurations

**Day 3:**

- Important Opamp Configurations
- Bandgap and Current Reference Circuits
- Distortion in Elementary Transistor Circuits
- Low-Power Continuous-Time Filters

**Day 4:**

- Matching of MOS Transistors in Deep-Submicron
- Micropower ADCs

**Day 5:**

- Layout Considerations in Mixed-Signal Circuit Design
- Ultra-Low Voltage Analog Circuit Design

**Keywords**

Low-Voltage Analog, Op-Amps, Sigma-Delta Converters, Switched-Capacitor

**Learning Prerequisites****Recommended courses**

Analog IC Design

**Resources**

**Ressources en bibliothèque**

- [Understanding Delta-Sigma Data Converters / Pavan](#)
- [Understanding delta-sigma data converters / Schreier](#)
- [Analog-to-Digital Conversion / Pelgrom](#)
- [Charge-Based MOS Transistor Modeling: The EKV Model for Low-Power and RF IC Design / Enz](#)
- [Methodology for the Digital Calibration of Analog Circuits & Systems / Kayal](#)
- [All-Digital Frequency Synthesizer in Deep-Submicron CMOS / Staszewski](#)
- [Structured Analog CMOS Design / Kayal](#)
- [Analog Design Essentials / Sansen](#)
- [RF analog impairments modeling for communication systems simulation : application to OFDM-based transceivers / Smaini](#)

**Websites**

- <http://mead.ch/MEADNEW/low-power-analog-ic-design-3/>