

EE-420

Analog circuits design I

Koukab Adil

Cursus	Sem.	Type
Electrical Engineering		Obl.
Electrical and Electronical Engineering	MA1, MA3	Obl.
Energy Management and Sustainability	MA1, MA3	Opt.
MNIS	MA3	Obl.
Microtechnics	MA1, MA3	Opt.

Language of teaching	English
Credits	2
Session	Winter
Semester	Fall
Exam	During the semester
Workload	60h
Weeks	14
Hours	2 weekly
Courses	2 weekly
Number of positions	

Summary

The student will be able to design analog integrated circuits (and the analog parts of VLSI circuits). He will master the device structures and the basic circuits used in bipolar and MOS technologies, as well as the basic principles underlying their correct layout.

Content**Fundamental principles**

Signal representation, insensibility to process and to physical parameters, principle of similarity and rules for optimum matching.

Analog circuits

Studies of different topologies, design methodologies and tradeoffs, specific limitation, implementation and design examples of the following circuits:

- Amplifiers
- Operational transconductance amplifier (OTA).
- Operational amplifier (Op Amp).

Keywords

Mos model, analog design, amplifiers design, stability criteria, low-power design

Learning Prerequisites**Recommended courses**

Devices and analog basic structures

Learning Outcomes

By the end of the course, the student must be able to:

- Establish the inversion level of MOS device
- Deduce the impact of the inversion level of device on IC design
- Design of basic MOS amplifiers
- Justify the topology choice of an OTAs
- Design each transistors of an amplifier according to the electronics constraints

Transversal skills

- Manage priorities.

Teaching methods

Ex cathedra with exercises

Assessment methods

Continuous control

Supervision

Office hours	No
Assistants	Yes
Forum	No

Resources

Bibliography

Duplicated lecture notes, slide copies, recent technical articles

Prerequisite for

Analog circuits design II and master thesis project