Advanced
Analog Integrated Circuit
2008 Fall

Instructor:

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Lectures: Tuessday/Thursday 16:00- 17:15, 301-104 EECS

T.A.: Hyungjoong Lee (이현중) 연습시간 (추후 공지)

Course Description:

This course deals with the analysis and design of analog CMOS integrated circuits, emphasizing fundaments as well as new paradigms that students and practicing engineers need to master in today's industry.

Course Materials:

Design of Analog CMOS Integrated Circuits: Behzad Razavi *

CMOS Analog Circuit Design, 2nd Edition: P. E. Allen and D. R. Holberg

Analog and Design of Analog Integrated Circuits, 4th Edition: P. R. Gray, P. J. Hurst, S. H. Lewis, and R. G. Meyer

Exams, Homework,
OP-Amp Design and Its Application Project and Grading:

There will be two equally weighted tests (60% total, 30% of the course's grade each). There will be several homework (15%) and OP-Amp Design Project (25%). Exams are closed books/ closed notes. Each of the tests will cover about a half of the course's material.

	Topics
1	Review of basic MOSFET physics
2	Review of basic MOSFET current-voltage relationships
3	Review of MOSFET small-signal models and the basics of CS Amplifier analysis
4	Review of MOSFET Current Mirror Current Sources The Threshold Voltage, Body Effect and Channel-Length Modulation effect
5	CS Amplifier analysis and design: Resistive Load
6	CS Amplifier : Diode-Connected Load
7	CS Amplifier Design: Current-Source Load, Triode Load
8	CS Amplifier with Source Degeneration
9	Source Follower Amplifier
10	Common-Gate Amplifier; Review of CMOS Processing Technology (Part 1)
11	Cascode Amplifier
12	MOSFET Differential Amplifier-Basic Principles
13	Common-Mode operation of MOSFET Differential Amplifiers; Differential Pair with MOS Load; Gilbert Cell
14	Cascode Current-Mirror Current Sources; Differential Amplifiers with Current Mirror load
15	High Frequency Response of Amplifiers – MOSFET capacitances; Miller Effect
16	Frequency Response of CS
17	Midterm and Term Project Handout
18	Frequency response of Source Followers and Common-Gate amplifiers
19	Frequency response of Cascode amplifiers and Differential amplifiers
20	Frequency Response of Multi-stage Amplifiers; Stability and compensation
21	Noise Effect in Amplifiers – basic principles; Noise in single-stage amplifiers
22	Feedback in CMOS amplifiers - basic concepts
23	Feedback Network Topologies and Feedback Network Loading effects
24	Feedback Design in CMOS op-amps