EE 435
Analog VLSI Circuit Design
Spring 2008
COURSE INFORMATION

Lecture: MWF 10:00 Rm 204 Marsten
Labs: Tues 11:00-1:50 Wed 6:10-9:00

Course WEB Site: http://class.ee.iastate.edu/ee435/

Note: Some weeks the laboratory will meet in the CAD Lab and other weeks it will meet in the measurements lab.

Lecture Instructor:
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Laboratory Instructor:
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Course Description:
Basic analog integrated circuit and system design including design space exploration, performance enhancement strategies, operational amplifiers, references, integrated filters, and data converters.

Required Text:

Analog Integrated Circuit Design
by D. Johns and K. Martin, Wiley, 1997

Reference Texts:

VLSI Design Techniques for Analog and Digital Circuits
by Geiger, Allen and Strader, McGraw Hill, 1990

CMOS Analog Circuit Design
by Allen and Holberg, Oxford, 2002.

CMOS: Circuit Design, Layout, and Simulation – Second Edition by J. Baker, Wiley, 2007.

Fundamentals of Microelectronics
by B. Razavi, McGraw Hill, 2008

Design of Analog CMOS Integrated Circuits
by B. Razavi, McGraw Hill, 1999

Introduction to CMOS Op Amps and Comparators
by R. Gregorian, Wiley, 1999

The Art of Analog Layout
by A. Hastings, Prentice Hall, 2001

Design of Analog Integrated Circuits
by Laker and Sansen, McGraw Hill, 1994

Analysis and Design of Analog Integrated Circuits-Fourth Edition
Gray,Hurst,Lewis and Meyer, Wiley, 2001

Analog MOS Integrated Circuits for Signal Processing
Gregorian and Temes, Wiley, 1986

Design of Low-Voltage Bipolar Operational Amplifiers
Fonderie and Huijsing, Kluwer, 1993

Frequency Compensation Techniquies for Low-Power Operational Amplifiers Eschauzier and Huijsing, Kluwer, 1995

Low-Noise Wide-Band Amplifiers in Bipolar and CMOS Technologies
Chang and Sansen, Kluwer, 1991

Introduction to the Design of Transconductor-Capacitor Filters
Kardontchik, Kluwer, 1992

Analog Circuit Design - Low-Power, Low-Voltage, Integrated Filters and Smart Power editors - van de Plassche, Sansen and Huijsing, Kluwer, 1995

Design of Bipolar and MOS-Circuits
Lecture Notes, McCreary, 1983

Grading: Points will be allocated for several different parts of the course. A letter grade will be assigned based upon the total points accumulated. The points allocated for different parts of the course are as listed below:

2 Exams	100 pts each
1 Final	100 pts.
Short Quizzes	15 pts. each
Homework	100 pts.total
Lab and Lab Reports	100 pts.total
Design Project	100 pts.

Short quizzes will be given occasionally and randomly determined each day. If a short quiz is missed, the score that will be recorded will be a 0 unless an excused absence is requested by email in advance of the quiz.

The due date for each HW assignment will be given. They are due at the beginning of the class period on the due date unless specified to the contrary. Late homework will be accepted up until 5:00 p.m. on the due date without penalty.

Laboratory:

There will be weekly laboratory experiments. The laboratory location will alternate between the electronics hardware laboratory and the VLSI CAD laboratory. An IC design project will be conducted in which student designs will be eligible for fabrication through the NSF-sponsored MOSIS program.

Design Project:

The design project will be the design of an 8-bit to 10-bit digital to analog converter (DAC). Additional details about the design project will be given after relevant material is covered in class. The option will exist to have this project fabricated through the MOSIS program. The design should be ready for fabrication and post-layout simulations are to be included as a part of the project.

Additional Comments

I encourage you to take advantage of the e-mail system on campus to communicate about any issues that arise in the course. I typically check my e-mail several times a day. Please try to include “EE 435" in the subject field of any e-mail message that you send so that they stand out from what is often large volumes of routine e-mail messages.