

EE 434
Analog and Digital VLSI Design
Fall 2005

COURSE INFORMATION

Room: Lecture - 270 Town
Labs - 1341 Coover (electronics lab)
- 1331 Coover (CAD lab)

Time: Lecture - MWF 12:10-1:00
Laboratory - Sec 2 Wed 1-4
- Sec 4 Thur 9-12
- Sec 5 Mon 6-9
- Sec 6 Wed 4-7

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

Lecture Instructor:

Randy Geiger
351 Durham
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Laboratory Instructors:

Saqib Malik Room 347 Durham sqmalik@iastate.edu 294-8643

Course Description:

Semiconductor processes and fabrication, device models, physical layout, simulation and verification. Design and use of analog and digital building blocks. Behavioral level descriptions of digital circuits and synthesis using standard cells.

Course Web Site: <http://class.ece.iastate.edu/ee434>

Homework assignments, lecture notes, laboratory assignments, and other course support materials will be posted on this WEB site. Students will be expected to periodically check the WEB site for information about the course.

Required Texts:

CMOS VLSI Design – A Circuits and Systems Perspective, Third Edition
by N. Weste and D. Harris, Addison Wesley, 2005

Reference Texts:

Digital Integrated Circuits (2nd Edition)

by Jan M. Rabaey, Anantha Chandrakasan, Borivoje Nikolic, Prentice Hall, 2002

Analog Integrated Circuit Design

by D. Johns and K. Martin, Wiley, 1997

Principles of CMOS VLSI Design

by N. Weste and K. Eshraghian, Addison Wesley, 1992

VLSI Design Techniques for Analog and Digital Circuits

by Geiger, Allen and Strader, McGraw Hill, 1990

CMOS Analog Circuit Design

by Allen and Holberg, HRW, 2002.

Design of Analog CMOS Integrated Circuits

by B. Razavi, McGraw Hill, 1999

Introduction to CMOS Op Amps and Comparators

by R. Gregorian, Wiley, 1999

CMOS Circuit Design, Layout and Simulation

by R.J. Baker, IEEE Press, 1997

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 Techniques 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.
Homework	100 pts.total
Quizzes	15 pts each
Lab and Lab Reports	100 pts.total
Design Project	100 pts.

If for any reason the final examination is waived, the two listed examinations will be weighted 150 points each.

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.

Homework:

Homework assignments are due at the beginning of the class period on the designated due dates. Late homework will be accepted, without penalty, up until 5:00 p.m. on the due date in Room 351 Durham.

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 434" 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.