

ECE 422/522 Fall 2012

CMOS Integrated Circuits - I

Instructor	Karti Mayaram
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Office Hours:	M 5:00-6:00 pm and by appointment
Web page:	http://www.ece.orst.edu/~karti/ece422.html http://classes.engr.orst.edu/eecs/
TA:	Ankur Guha Roy (guharoya@eecs.oregonstate.edu)
TA Office Hours:	W 6:00-7:00 pm (KEC Atrium) and by appointment
Course Objective:	Learn principles, analysis, and the design of MOS analog integrated circuits.
Grading:	Homework (7-8 assignments) 10% Test (2) 25% each (Tu 10/23/12, Th 11/15/12). Project 15% Final Exam 25% (We 12/05/12, 2:00-3:50PM).
Cheating Policy:	You may work together on homeworks but not copy someone else's work. Cheating is unacceptable.
TextBook:	Gray, Hurst, Lewis, and Meyer, <i>Analysis and Design of Analog Integrated Circuits</i> , John Wiley & Sons, 2009.
References:	Razavi, <i>Design of Analog CMOS Integrated Circuits</i> , McGraw-Hill, 2001. Sedra and Smith, <i>Microelectronic Circuits</i> , Oxford University Press, 2003. Allen and Holberg, <i>CMOS Analog Circuit Design</i> , Oxford University Press, 2002. Muller and Kamins, <i>Device Electronics for Integrated Circuits</i> , John Wiley & Sons, 1993. Foty, <i>MOSFET Modeling with SPICE: Principles and Practice</i> , Prentice Hall, 1997. Kundert, <i>The Designer's Guide to SPICE & SPECTRE</i> , Kluwer Academic Publishers, 1995.

Course Outline

(1 week)	MOS device characteristics and models: large- and small-signal models, SPICE models
(3 weeks)	Basic analog circuit building blocks: gain stages, differential pair, current mirrors
(2 weeks)	Design of operational amplifiers: general characteristics, two-stage
(3 weeks)	Frequency response, feedback, stability, and compensation

9. COURSE ETHICS

Students are expected to uphold high ethical standards including adherence to Oregon State University [Academic Regulations](#) and [Student Regulations](#). Also see <http://eecs.oregonstate.edu/graduate/cs/dishonesty.html>

You are permitted and to a great extent encouraged to seek the advice of others. However, any help/advice you receive must be fully documented so that you do not falsely represent yourself and your work. This course requires that ALL material submitted for grade contain complete documentation including a "References" section appended to the end of each submission. The following table lists some examples of how to properly document your work.

Using only the course text book, you complete a homework set.	References: None
You work with a group to complete a homework set.	References: I worked concurrently with Joe Smith, Karen Peavy, and John Shu on this homework set as part of a study group.
You are stuck on how to draw the free body diagram for one of the problems in a homework set and ask John Smith how he approached the problem.	References: John Smith explained how to set up the free body diagram on problem 1.
You cannot get your computer program to properly simulate a system and you look at Sally Yam's working computer code.	References: I looked at Sally Yam's properly working computer code to try to figure out what I was doing wrong.

Note that none of the examples listed above would result in a loss of points to the student.