

UNIVERSITY OF SOUTHERN CALIFORNIA
School of Engineering
Department of Electrical and Computer Engineering

E.S. Kim

EE 479, Fall 2019

Analog Integrated Circuit Design

4 Units -- TuTh 5:00 - 6:20, RTH 105

F 2:00 – 2:50, OHE 100C

Instructor: Prof. Eun Sok Kim
PHE 602, 740-4697, eskim@usc.edu

Office Hours: TuTh 4:00 - 4:50.

Textbook: "Analysis & Design of Analog Integrated Circuits, 5th Ed." by Gray, et al., J. Wiley & Sons, 2009.

References: "Design of Analog CMOS Integrated Circuits" by Behzad Razavi, McGraw Hill, 2001.

"The SPICE Book," by A. Vladimirescu, J. Wiley and Sons, 1994

Prerequisite: EE348

Course Description and Objectives:

This course teaches analysis and design techniques for analog integrated circuits (ICs). After this course, students should be able to

- (1) analyze any analog MOS and BJT ICs from DC bias condition to AC small signal behavior.
- (2) design wide-bandwidth amplifiers with current mirrors, active loads and voltage references.
- (3) analyze frequency response of analog ICs and stability of feedback amplifiers.
- (4) understand noise sources in MOS and BJT and design low-noise amplifiers.

Tentative Course Contents:

Week	Topic	Reading from the textbook
1 and 2	Models for IC Active Devices	Ch. 1.4 - 1.9, 2.5, 2.9, 2.11
2 and 3	Single- and Multiple-Transistor Amplifiers	Ch. 3
4 and 5	Current Mirrors, Active Loads, and References	All Ch. 4 except 4.4.3
6	Output Stages	Ch. 5.2.2, 5.3 and 5.5
7	Midterm Exam	
8 and 9	Frequency Response of IC	All Ch. 7 except 7.4
10 and 11	Feedback	All Ch. 8 except 8.7
12 and 13	Frequency Response & Stability of Feedback Amplifiers	All Ch. 9 except 9.4.5 and 9.5
14 and 15	Noise in IC	All Ch. 11

Grading: Homework: 20 % including 5% for SPICE simulations, Midterm Exam: 30%, Final Exam: 50 %.

Late homework (received only till 5pm on the lecture date following the homework due date) will lose up to 50% credit.