ANALOG IC DESIGN

PROF. S. ANIRUDDHAN
Department of Electrical Engineering
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PRE-REQUISITES : UG course (or equivalent) on: Basic Electrical Circuits, Signals and Systems, Analog Circuits

INTENDED AUDIENCE : B.E/B.Tech,M.E/M.Tech,M.S,PhD engineering subject

COURSE OUTLINE :
This course will introduce advanced concepts in analog circuit design specifically relevant to CMOS IC design. It will cover circuit noise and mismatch, their analysis, and their impact on CMOS opamp design. As prerequisites, the student is expected to have undergone a course on (a) basic circuit theory and analysis (b) signals and systems and (c) MOS analog circuits. At the end of this course, the student should be able to design and analyze several types of CMOS opamps at the transistor level.

ABOUT INSTRUCTOR :
Prof. S.Aniruddhan is an Assistant Professor in the Integrated Circuits and Systems group of the department of Electrical Engineering at Indian Institute of Technology Madras. He works broadly in the area of Analog IC design, with specific focus on RFIC design. He obtained a B. Tech. degree in Electrical Engineering from IIT Madras in 2000, and a Ph.D. degree from the University of Washington, Seattle in 2006. Between 2006 and 2011, he worked in the RF-Analog group at Qualcomm Inc., San Diego, designing integrated circuits for Cellular RF applications.

COURSE PLAN :

Week 1 : Negative Feedback control

Week 2 : Negative feedback with ideal delays

Week 3 : Nyquist criterion, Gain and phase margin

Week 4 : Single and two-stage opamps at block level

Week 5 : Three-stage and feedforward compensated opamps

Week 6 : Opamp datasheet, CMOS process

Week 7 : MOS transistor basics

Week 8 : Noise in circuits

Week 9 : Basic amplifier stages

Week 10 : Single-stage opamp

Week 11 : Cascode opamp

Week 12 : Two-stage opamp