TYPE OF COURSE : Rerun | Elective | UG/PG
COURSE DURATION : 12 weeks (18 Jan’ 21 - 09 Apr’ 21)
EXAM DATE : 25 Apr 2021

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