Analog Integrated Circuits II

ECE 5021

Credit Hours:
3.00

Course Levels:
Undergraduate (1000-5000 level)
Graduate (5000-8000 level)

Course Components:
Lecture

Course Description:
Advanced analog integrated circuits. Linear feedback networks design and stability analysis, multi-stage CMOS op-amp design and compensation, fully-differential op-amps and common-mode feedback networks, comparators, transconductors, bandgaps, sample and hold circuits, switched-capacitor circuits, noise analysis of CMOS circuits.

Prerequisites and Co-requisites:
Prereq: 4021; or Grad standing in Engineering, and permission of instructor.

Course Goals / Objectives:
- Be competent in the design techniques and large-signal and small-signal analysis of single-ended and fully-differential CMOS opamps, fully differential CMOS amplifiers, multi-stage amplifiers and comparators; design and performance trade-offs.
- Be competent in performing stability analysis and simulations of linear feedback networks and identifying poles and zeros and their types in analog circuits.
- Be competent in noise analysis of CMOS analog circuits.
- Be competent in the use of modern integrated circuit design CAD tools an din performing AC, DC, and transient simulations.
- Be competent in writing design reports
Course Topics:
- Introduction to basic analog circuit blocks
- Linear feedback networks design and analysis
- Multi-stage CMOS op-amp design and compensation
- Applications to linear power regulators
- Fully-differential op-amps and common-mode feedback networks
- Comparators and Transconductors
- Bandgaps and Sample and hold circuits
- Switched-capacitor circuits
- Noise analysis of CMOS circuits

Designation:
Elective