



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 and in performing AC, DC, and transient simulations.
 - Be competent in writing design reports
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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
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Designation:

Elective