Mixed Signal VLSI

ECE 5020

Credit Hours:
3.00

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

Course Components:
Lecture

Course Description:
Design and circuit analysis of basic VLSI structures such as registers, cell libraries, digital and analog I/O. Physical layout, timing analysis, PLLs, design tools.

Prerequisites and Co-requisites:
Prereq: 3020, or Grad standing in Engineering, Biological Sciences, or Math and Physical Sciences.

Course Goals / Objectives:
- Be familiar with integrated circuit design flows and project planning
- Be competent in CMOS circuit performance characterization using CAD tools
- Master the analysis and design of CMOS logic circuits
- Be competent in clean physical layout of standard CMOS logic cells using CAD tools
- Be competent in analysis and design of arithmetic logic building blocks and memo
- Be exposed to system design, including interconnect, clocking and power distribution.
- Be competent in working effectively in a team to complete a design project.
Course Topics:
- Design flow and project planning
- CMOS circuit and logic design
- MOS transistor equations and circuit performance characterization - speed, power, reliability.
- CMOS fabrication, design rules, and physical layout
- Use of CAD tools, circuit simulation techniques
- System design, array subsystems, special purpose systems - clocking, I/O pads, analog

Designation:
Elective