



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.
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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
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Designation:

Elective