



ENEE: 719C - Mixed Signal VLSI Circuit Design

Course Goals:

This course is an advanced course on Mixed Signal VLSI design. We will review integrated circuits devices and deep sub-micron modeling. We will study the theory and design of mixed-signal circuits such as non-linear and switch analog, data conversion and interface circuits. Using a state-of-the-art VLSI CAD environment provided by CADENCE Design Systems, we will design and verify these circuits at various levels of abstraction. There will be a chip design project that can be submitted to MOSIS for fabrication.

Course Prerequisite(s):

Pre-requisite: ENEE 408B and ENEE 408D (or equivalent) and permission of instructor

Co-requisite: ENEE 696

Topics Prerequisite(s):

Textbook(s)

Required: Baker, Li and Boyce, CMOS Circuit Design, Layout and Simulations, 1998

Recommendation: VerilogHDL: A guide to digital design and synthesis, S. Palnikar, 1996

Tools: Cadence Design Systems, SPICE, VerilogHDL

Reference(s):

Core Topics:

1. IC Devices
2. Scaling Issues
3. Deep Sub-micron SPICE Modeling, Layout and Verification
4. Non-linear Analog Circuits
5. Dynamic Analog Circuits
6. Data Converter Fundamentals

7. Data Converter Architectures
8. Read-out Electronics for Imaging Systems

Optional Topics:

Course Structure:

2 In-class Exams (Open Book): 50% of Grade

Design Project, Bi-weekly Presentations and Final Report (IEEE Paper Style): 50% of Grade

Maintained by: khodary@eng.umd.edu

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| [Dept. of Electrical & Computer Engineering](#) | [A. James Clark School of Engineering](#) | [University of Maryland](#) |
