

ECE5020 Mixed Signal VLSI Design

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Text: *Digital Integrated Circuits, 2nd ed.* by J. Rabaey et. al. Prentice Hall, 2003

Supplemental Text: *CMOS VLSI Design A Circuits and Systems Perspective, 4th Edition*, by N. Weste and D. Harris, Addison-Wesley, 2011.

Course Objectives: The objective of this course is to introduce the student to the detailed design of VLSI integrated circuits. The circuits to be studied are CMOS circuits. The student will be introduced to chip operation, chip manufacturing, and the use of VLSI computer aided design tools. The student will complete an individual project and/or group project using the concepts presented in class.

Initial Syllabus

Subject	Reading
Class Organization	Textbook, web pages
Design Flow and CAD tools	Weste Ch. 1, Notes
Project Planning	Notes
Intro to CMOS Circuits	Ch. 1
Design Descriptions - Digital & Analog	Ch. 1, Notes, online
CMOS Circuit and Logic Design	Ch. 1
MOS transistor Equations	Ch.
CMOS Processing & Design Rules	Ch.
Circuit Characterization	Ch.
Circuit Robustness	Ch.
Circuit Simulation Techniques	Ch.
CMOS Combinatorial and Sequential Design	Ch.
System Design and Design Methods	Ch.
Array Subsystems – SRAM, CAM	Ch.
Special-purpose Systems: Clock, I/O Pads, Analog	Ch.
Data Converters	online
Asynchronous Circuit Design	online

Deliverables and Grading:

Homework and some Quizzes – 17%
Midterm 1 – 28% Design Report – 20 % Final Exam – 35%

Homework & Quizzes are due in class on the due date. Without prior permission, other homework/quiz turn in times get partial or no credit.