

EE 4325 VLSI Design

Prof. Carl Sechen
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Office Hours:

- TuTh 12p – 1p and by appointment

Lectures

- TuTh 1p - 2:15p Room: ECSN 2.112

Textbooks: (recommended, not required)

Fourth Edition of *CMOS VLSI Design: A Circuit and Systems Perspective* by Weste and Harris (Pearson ISBN: 0321547748)

Digital VLSI Chip Design with Cadence and Synopsys CAD Tools, by Erik Brunvand, Addison Wesley, March 2009, ISBN-13: 9780321547996

Student Learning Objectives:

- Ability to analyze effects of MOS device properties and parasitics on digital circuit design.
- Ability to design, analyze, simulate and layout CMOS gates.
- Ability to design latches and flip-flops and analyze timing and clocking issues.
- Ability to design basic datapath and memory building blocks.
- Use standard CAD tools to design, layout and simulate VLSI circuits.
- Ability to design and implement a small digital integrated circuit.

Lecture Topics:

1. Review of MOS device operation
2. CMOS inverter
3. Static CMOS gates
4. Layout of static CMOS gates
5. Design of flip-flops
6. The method of logical effort
7. SRAM design
8. Other CMOS logic techniques, such as dynamic logic
9. Adders and other arithmetic blocks

Grading:

- Exams 70% (non-overlapping exams)
 - Up to 8 random quizzes (each 5 mins) at start of lecture (3%)
 - Midterm 1 (11%): Thursday February 27
 - Midterm 2+3 combined (20%): Thursday April 23 1pm (2 hrs TBA)
 - CAD tools exam (12%): Friday May 1
 - Final Exam (24%): May 7 2pm (2.5 hrs)

- Projects 30%

Project, broken into 6 milestones, with due dates as below:

1. Verilog (or VHDL) design: Jan. 28 (class start time)
2. Synthesizable Verilog (or VHDL) design: Feb. 13 (class start time)
3. Inverter design and layout: Feb. 25 (class start time)
4. Cell library design and layout: Mar. 2 5pm
5. Flip-flop design and layout: Apr. 16 5pm
6. Final layout (placement and routing) of your design: April 30 5pm

Lab for project work:

- Solarium (4th floor of ECSN)

Teaching Assistant:

- TBA (room 3.102)

Comet Creed

This creed was voted on by the UT Dallas student body in 2014. It is a standard that Comets choose to live by and encourage others to do the same:

“As a Comet, I pledge honesty, integrity, and service in all that I do.”

UT Dallas Syllabus Policies and Procedures

The information contained in the following link constitutes the University’s policies and procedures segment of the course syllabus.

Please go to <http://go.utdallas.edu/syllabus-policies> for these policies.

The descriptions and timelines contained in this syllabus are subject to change at the discretion of the Professor.