EE477 Syllabus and Approximate Fall 2014 Calendar

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Text:

CMOS Digital Integrated Circuits, 4th edition, Kang, Leblebici and Kim, McGraw-Hill

Credit:

Homework: 10%
2 MidTerms: 50%
Project Labs 1-3: 40% total

Other References:

Integrated Circuits: A Design Perspective, Jan Rabaey, Prentice Hall

Digital Integrated Circuit Design, Martin, Oxford

CMOS VLSI Design: A Circuits and Systems Perspective, Neil Weste and David Harris third edition, Addison Wesley

Note: Readings and topics are approximate. More details about readings will be given in the lectures.

Lecture #	Topic	Text Reference
1	Class Introduction	Chapter 1, 1.1-1.11,web pages
2	Introduction to CMOS Circuits; MOS Transistor Theory, stick diagrams, transmission gates	Chapter 1, 1.1-1.11
3	Latches, CMOS Processing Technology and Fabrication	Chapter 2, 2.1-2.3
4	Fabrication	
5	CMOS Design Rules	Chapter 2, 2.4-2.5
6	MOS Transistor Theory - IV Characteristics	Chapter 3, 3.3 pp. 90-93,99-100, Sec. 3.4 through p. 106
7	MOS Transistor Theory - Capacitance, Threshold Voltage, Scaling	Chapter 3, 3.2, 3.3 pp. 94-98, 3.4, 3.5
8	Capacitance, Inverter Characteristics	Chapter 3, 3.6, Chapter 5, 5.4
9	Inverter Characteristics, Transmission Gate Characteristics	Chapter 5, 5.1, Chapter 6, 6.1
10	Fabrication Videos	
11	Midterm Review	
	Midterm Examination I - Tentative Date	
12	Midterm Discussion	
13	Device Sizing	Course notes
14	CMOS Physical Design - Euler Paths	Chapter 7, Section 7.4

15	nterconnections, Layout Strategies	Course notes
16	Inverter Fall Time/Delay	Course notes, Chapter 6, 6.1-6.3
17	Inverter Delay	Chapter 6, 6.1-6.3
	Spring Break	
	Spring Break	
18	Delay and Inverter Optimization	Chapter 6, 6.1-6.4
19	Sequential Circuits and Interconnect Delay	Chapter 8, 8.1-8.2, 8.5, Chapter 6, 6.6
20	Interconnect Resistance and Capacitance, Interconnect Delay	Chapter 6, 6.5-6.6
21	Interconnection Delay	Course notes, Chap. 6, 6.4-6.6
22	Delay computations	Course notes
23	Super buffer design/ Ring Oscillators	Chapter 6 Appendix
24	Midterm review	
	Midterm Examination II - Tentative Date	
25	Midterm discussion	
26	Power consumption	Chap. 6, 6.7
27	Dynamic circuits/Domino logic/Memories	Chapter 9
28	Future Technologies and Research	Course notes