Course Syllabus: Physics 476, UH Spring Semester 2015

Special ASIC-specific version

Instructor: Dr. Gary Varner

Class Hours: T R 10:30 - 11:45am; Lab T 12:30 - 1:20; R 12:30 - 3:30pm Watanabe 221

week	date	Lecture topics	Laboratory topics
1	13-Jan	Intro to ASICs	computer resources
	15-Jan	Design specs/Deadline Manage	Cadence/ID Lab server Acct.
2	20-Jan	Intro to IC fabrication	Ex. 0: The design viewpoint
	22-Jan	Schematic capture (I)	Ex.1: Tutorial 1
3	27-Jan	Extra lab time	Ex. 2: Tutorial 2
	29-Jan	Schematic capture (III)	Ex. 3: Tutorial 3
4	3-Feb	Bipolar vs. CMOS	Ex. 4: Your design kit
	5-Feb	Building blocks (I)	
5	10-Feb	DAC/Special circuit topics (I)	Ex. 5: Basic hierachy build
	12-Feb	Special circuit topics (I)	
6	17-Feb	ADC/Special circuit topics (II)	Ex. 6: Specs
	19-Feb	Special circuit topics (II)	Specification Review
7	24-Feb	Intro to SPICE	Ex. 7: Simulation intro
	26-Feb	Tolerance and robustness	
8	3-Mar	Input coupling	Ex. 8: SPICE Convergence
	5-Mar	Impedance matching	
9	10-Mar	Analog bandwidth	Ex. 9: SPICE limitations
	12-Mar	Design resources	
10	17-Mar	Power	Ex. 10: Design proof
	19-Mar	Ideal Performance	Conceptual Design Review
11	24-Mar	SPRING	SPRING
	26-Mar	BREAK	BREAK
12	31-Mar	Extra lab time	Ex. 11: Intro to Layout
	2-Apr	Extra lab time	
13	7-Apr	Bipolar vs. CMOS	Ex. 12: Layout optimization
	9-Apr	Clock/Power distrib. Theory	
14	14-Apr	Large system design	Ex. 13: Floorplanning
	16-Apr	MOSIS and Fab. Processes	
15	21-Apr	Project Theory (I)	Project work
	23-Apr	Design submission	Project work
16	28-Apr	Project Theory (II)	Artwork generation
	30-Apr	Deadline Management (Rev)	Project work
17	5-May	Final Design Review Prep.	Final Design Review
	7-May	The Success of Failures	Final Design Review (latest)
18	TBD	**Someday:** Final Presentations -- 9:45 - 11:45 am	

Prerequisite: Physics 475, equivalent or premission from instructor

Texts: Horowitz & Hill: *The Art of Electronics*

Johnson & Graham: High-Speed Digital Design: *A Handbook of Black Magic*

Office hours: Any time in WAT214 by appointment

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Exercises: **Mandatory --** must be completed prior to next lab session

Grading: 20% Exercises

40% Final project

20% Final presenation

20% Final report