Bhoj Reddy Engineering College for Women: Hyderabad

Department of Electronics and Communication Engineering

Lesson plan of faculty member for the academic year 2018–17

Class: III B Tech Branch-Section: ECE-C Semester: II

Subject: VLSI Design Lectures per week: 4+1 (Tutorial)

Lecture Number	Topics to be covered	Date (s)
UNIT – I: Introduction & Basic Electrical Properties		
1	Introduction to Syllabus, Basics of IC	18 December 2017
2	Introduction to IC Technology	19 December 2017
3	Oxidation, Lithography (Extra topic)	20 December 2017
4	Diffusion, Ion Implantation (Extra topic)	21 December 2017
5	Metallization, Encapsulation (Extra topic)	22 December 2017
6	Tutorial (G2, G3,G1) - Fabrication Steps	18, 21, 22 December 2017
7	Fabrication Process-MOS,PMOS	23 December 2017
8	NMOS, CMOS	28 December 2017
9	BICMOS	29 December 2017
10	Tutorial (G2, G3,G1) – Differences between CMOS and BJT	
11	Basic Electrical Properties of MOS and BiCMOS circuits: Ids - Vds relationship	2 January 2018
12	MOS transistor threshold Voltage	2January 2018
13	Gm, gds, figure of merit	4 January 2018
14	Pass transistor	5 January 2018
15	NMOS Inverter	6 January 2018
16	Tutorial(G3, G1) - Problems on threshold voltage	4, 6 January 2018
17	Various pull-ups	8 January 2018
18	Various pull-ups(continued)	10 January 2018
19	CMOS inverter analysis and design	11 January 2018
20	BiCMOS inverter	12 January 2018
21	Tutorial (G2, G3, G1) - Problems on Rds, gm	8,10, 13 January 2018
UNIT-II: **VLSI Circuit Design Processes**		
22	VLSI design flow	16 January 2018
23	MOS layers	18 January 2018
24	Stick diagrams	19 January 2018
25	Design Rules and layout 2 micron CMOS design rules	20 January 2018
26	Tutorial (G3, G1, G2) - Problems on stick diagrams and layouts	18,20 January 2018
27	Design Rules and layout 2 micron CMOS design rules	22 January 2018
28	Design rules for wires, contacts and Transistor	23 January 2018
29	Layout using NMOS, CMOS AND GATES	24 January 2018
30	Scaling of MOS circuits	25 January 2018
31	Tutorial (G3, G2) - problems on Logic gates	22, 23 January 2018
UNIT-III: **Gate Level Design**		
32	Logic gates and other complex gates, Switch Logic	29 January 2018
33	Alternate gate circuit	30 January 2018
34	Basic circuit Component	1 February 2018
35	Sheet resistances, Area capacitance Units	2 February 2018
36	Tutorial (G3, G1, G2) - problems on Stick diagrams using nmos and pmos logic	29, 30 January,2 February 2018
37	Calculations delays, Driving large capacitive loads	5 February 2018
38	Wiring Capacitance, Fan in Fan out, Choice of layers	6 February 2018
39	Tutorial (G2, G1) - problems on Stick diagrams using nmos and pmos logic	5, 10 February 2018

UNIT-IV: **Data Path Subsystems & Array Subsystems**		
40	SUBSYSTEM DESIGN	12 February 2018
41	Shifters	15 February 2018
42	Adders	16 February 2018
43	Adders(cont..)	17 February 2018
44	Tutorial (G2, G3, G1) - problems on layout diagrams using cmos logic	12, 15,17 February 2018
45	ALU'S	19 February 2018
46	Multipliers	20 February 2018
47	Parity generators	22 February 2018
48	Comparator	24 February 2018
49	Tutorial (G2, G3, G1) - problems on Sheet resistance R_s and inverter ON resistance Ron	19, 22,24 February 2018
50	Zero /One detector	26 February 2018
51	Counters	27 February 2018
52	SRAM	1 March 2018
53	DRAM	2 March 2018
54	Tutorial (G2, G3, G1) - problems on adders, Shifters	26, 27 February, 2 March 2018
55	ROM	5 March 2018
56	Serial Access Memories	6 March 2018
57	Content Addressable Memory	8 March 2018
UNIT-V: **Programmable Logic Devices & CMOS Testing**		
58	PLA	9 March 2018
59	Tutorial (G2, G3, G1) - problems on Counters	5, 8, 9 March 2018
60	FPGA, CPLD	12 March 2018
61	Standard cells PAL	13 March 2018
62	Design Approach	15 March 2018
63	Tutorial (G2, G3, G1) - Problems on PAL	12, 15, 17 March 2018
64	Parameters influencing low power design	19 March 2018
65	Need for testing	20 March 2018
66	Test Principles	21 March 2018
67	FPGA, CPLD comparisons	22 March 2018
68	PLA, PAL Comparisons	23 March 2018
69	Tutorial (G2, G3, G1) - Problems on PROM	19, 20, 23 March 2018
70	Testing FPGA and CPLD	27 March 2018
71	Comparison between FPGA and CPLD	29 March 2018
72	Design Strategies for test	2 April 2018
73	Chip level test Technique	3 April 2018
74	Tutorial (G2, G3, G1) - problems on PLA and LUT	2, 3, April 2018
75	Problems on Vt, Ids	9 April 2018
76	Problems from previous question papers	10 April 2018

Text books:

1. Essentials of VLSI circuits and systems – Kamran Eshraghian, Eshraghian Dougles and A. Pucknell, PHI,2005 Edition.
2. VLSI Design- K.Lal Kishore.V.S.V.Prabhakar, I.K.International, 2009.
3. CMOS VLSI Design – Niel H.E.Weste, David Harris, Pearson, 2009.
4. CMOS logic circuit design john p Uyemura, Springer, 2007.
5. Modern VLSI Design-Wayne Wolf Pearson education, 3rd edition, 1997.

Name and signature of the faculty: Mr Suresh S ----

Name and signature of Head of the Department: Ms Shribala N ----