

# Bhoj Reddy Engineering College for Women: Hyderabad

## Department of Electronics and Communication Engineering

Lesson plan of faculty member for the academic year 2017–18

Class: III B Tech

Branch-Section: ECE-A

Semester: II

Subject: VLSI Design

Lectures per week: 4+1 (Tutorial)

Lecture Number	Topics to be covered	Date (s)
<b>UNIT – I: Introduction &amp; Basic Electrical Properties</b>		
1	Introduction to Syllabus, Basics of IC	18 December 2017
2	Introduction to IC Technology	19 December 2017
3	Tutorial(G2,G1, G3) Oxidation, Lithography	19,21,22 December 2017
4	Diffusion, Ion Implantation	21 December 2017
5	Metallization, Encapsulation	22 December 2017
6	Fabrication Process-MOS,PMOS	28 December 2017
7	Tutorial(G1, G3) - Fabrication Steps	28 ,29 December 2017
8	NMOS ,CMOS	28 December 2017
9	BICMOS	29 December 2017
10	Basic Electrical Properties of MOS and BiCMOS circuits: Ids - Vds relationship	2 January 2018
11	MOS transistor threshold Voltage Gm, gds, figure of merit	4 January 2018
12	Tutorial( G2, G1, G3) - Problems on threshold voltage	2,4,5 January 2018
13	Pass transistor ,NMOS Inverter ,Various pull-ups	4 January 2018
14	Various pull-ups(continued), CMOS inverter analysis and design	4 January 2018
15	CMOS inverter analysis and design cont	5 January 2018
16	BiCMOS inverter	8 January 2018
17	Tutorial(G1, G3) - Problems on Rds, gm	9,11,12 January 2018
<b>UNIT-II: VLSI Circuit Design Processes</b>		
18	MOS layers	11 January 2018
19	Stick diagrams	11 January 2018
20	Design Rules and layout 2 micron CMOS design rules	12 January 2018
21	Problems on stick diagrams and layouts	9, 10,12 January 2018
22	Design Rules and layout 2 micron CMOS design rules	16 January 2018
23	Tutorial( G2, G1, G3) - Design rules for wires, contacts and Transistor	16,18,19 January 2018
24	Layout using NMOS, CMOS	18 January 2018
25	Scaling of MOS circuits	19 January 2018
<b>UNIT-III: Gate Level Design</b>		
26	Logic gates and other complex gates , Switch Logic	22 January 2018
27	Alternate gate circuit	23 January 2018
28	Basic circuit Component Tutorial(G2, G1) -	23,25 January 2018
29	problems on Stick diagrams using nmos and pmos logic	25 January 2018
30	Sheet resistances , Area capacitance Units	29 January 2018
31	Calculations delays, Driving large capacitive loads	30 January 2018
32	Wiring Capacitance ,Fan in Fan out, Choice of layers	01 February 2018
33	Tutorial(G2, G1, G3) - problems on Stick diagrams using nmos and pmos logic	30 January 1,2 February 2018
<b>UNIT-IV: Data Path Subsystems &amp; Array Subsystems</b>		
34	Subsystem Design	02 February 2018
35	Shifters	05 February 2018
36	Adders	06 February 2018
37	Adders(cont..)	12 February 2018
38	Tutorial( G1, G3) - problems on layout diagrams using cmos logic	15,16 February 2018
39	ALU'S	15 February 2018
40	Multipliers	16 February 2018
41	Parity generators	19 February 2018

42	Comparator	20 February 2018
43	Tutorial (G2, G1, G3) - problems on Sheet resistance $R_s$ and inverter ON resistance $R_{on}$	20,22,23 February 2018
44	Zero /One detector	22 February 2018
45	Counters	23 February 2018
46	SRAM	26 February 2018
47	DRAM	27 February 2018
48	Tutorial(G2, G3) - problems on adders, Shifters	27 February, 2 March 2018
49	ROM	5 March 2018
50	Serial Access Memories	6 March 2018
51	Content Addressable Memory	8 March 2018
<b>UNIT-V: Programmable Logic Devices &amp; CMOS Testing</b>		
52	PLA	8 March 2018
53	Tutorial(G2, G1, G3) - problems on Counters	6,8,9 March 2018
54	FPGA,	12 March 2018
55	CPLD	13 March 2018
56	Standard cells ,	15 March 2018
57	PAL	15 March 2018
58	Design Approach	16 March 2018
59	Tutorial(G2, G1, G3) - Problems on PAL	13,15,16 March 2018
60	Parameters influencing low power design	20 March 2018
61	Need for testing	22 March 2018
62	Test Principles	22 March 2018
63	Tutorial(G2, G1, G3) - Problems on PROM	20,22,23 March 2018
64	Design Strategies for test	27 March 2018
65	Chip level test Technique	29 March 2018
66	Tutorial( G2, G1) - problems on PLA and LUT	27,29 March 2018
67	Revision and discussion	2 April 2018
68	Revision and discussion	3 April 2018
69	Tutorial( G2)Revision and discussion	3 April 2018

#### Text books:

1. Essentials of VLSI circuits and systems – Kamran Eshraghian, Eshraghian Douglas 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: Archana Subhash ----

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