Bhoj Reddy Engineering College for Women: Hyderabad

Department of Electronics and Communication Engineering

Lesson plan of faculty member for the academic year 2020–21

Class: IV B Tech Branch-Section: ECE-B Semester: I

Subject: VLSI Design Lectures per week: 4

Lecture Number	Topics to be covered	Date (s)
UNIT – I: Introduction & Basic Electrical Properties		
1	Introduction to IC Technology	01 September 2020
2	Wafer Preparation, Oxidation, Lithography (Extra topic)	03 September 2020
3	Diffusion , Ion Implantation (Extra topic)	04 September 2020
4	Metallization, Encapsulation (Extra topic)	07 September 2020
5	MOS Transistor Operation	08 September 2020
6	Fabrication Process - MOS, PMOS, NMOS	10 September 2020
7	CMOS Fabrication Process: P-Well, N-Well	11 September 2020
8	CMOS Fabrication Process: SOI, Twin Tub Process	14 September 2020
9	BICMOS Fabrication Process	15 September 2020
10	Basic Electrical Properties of MOS and BiCMOS circuits: Ids-Vds relationship, Problems	17 September 2020
11	MOS Transistor threshold Voltage, Gm, Gds, figure of merit	18 September 2020
12	Pass transistor, NMOS Inverter Operation, Characteristics	21 September 2020
13	NMOS Inverter various pull-ups & pull-downs	22 September 2020
14	CMOS inverter analysis and design	24 September 2020
15	BiCMOS inverter	25 September 2020
UNIT – II: VLSI Circuit Design Processes		
16	VLSI design flow	28 September 2020
17	MOS layers	29 September 2020
18	Stick diagrams and examples	01 October 2020
19	Design Rules and layout 2 micron	05 October 2020
20	CMOS design rules	06 October 2020
21	Design rules for wires, Contacts and Transistor	08 October 2020
22	Layout using NMOS, CMOS Inverters and Gates using examples	09 October 2020
23	Scaling of MOS circuits	12 October 2020
UNIT – III: Gate Level Design		
24	Logic gates and other complex gates	13 October 2020
25	Switch Logic	15 October 2020
26	Alternate gate circuit with examples	16 October 2020
27	Sheet resistances, Area capacitance Units(Extra topic)	26 October 2020
28	Calculations of time delays	27 October 2020
29	Driving large capacitive loads	29 October 2020
30	Wiring Capacitance, Fan-in, Fan-out	09 November 2020
31	Choice of layers	10 November 2020
UNIT – IV: Data Path Subsystems & Array Subsystems		
32	Subsystems Design, Shifters	12 November 2020
33	Adders, ALU'S	13 November 2020
34	Multipliers	16 November 2020
35	Parity generators	17 November 2020
36	Comparator	19 November 2020
37	Zero /One detector	20 November 2020
38	Counters	23 November 2020
39	SRAM	24 November 2020

40	DRAM	26 November 2020
41	ROM	27 November 2020
42	Serial Access Memories	01 December 2020
UNIT – V: Programmable Logic Devices & CMOS Testing		
43	PLA with Examples	03 December 2020
44	FPGA	04 December 2020
45	CPLD	07 December 2020
46	Standard cells	08 December 2020
47	PAL with Examples	10 December 2020
48	Design Approach	11 December 2020
49	Parameters influencing low power design	14 December 2020
50	Need for testing	15 December 2020
51	Test Principles	17 December 2020
52	Design Strategies for test	18 December 2020
53	Chip level testing techniques	21 December 2020
54	Chip level testing techniques	22 December 2020
55	Revision of Stick diagrams	24 December 2020
56	Revision of Fabrication Process	28 December 2020
57	Revision of Multipliers	29 December 2020
58	Revision of Counters	31 December 2020
59	Revision of Adders	01 January 2021

TEXTBOOKS:

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.

REFERENCE BOOKS:

1. CMOS logic circuit design john p Uyemura, Springer, 2007.
2. Modern VLSI Design-Wayne Wolf Pearson education, 3rd edition, 1997.

Name and signature of the faculty: Ms K SrinidhiReddy ----

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