



Christu Jyothi Institute of Technology & Science
Colombonagar, Yeshwanthapur, Jangaon

Department of Electronics and Communication Engineering

Program Name:	B.Tech ECE	AY	2022-23
Course Name:	EC823PE: LOW POWER VLSI DESIGN (PE – VI)	Class/Sem	IV/II
Faculty Name:	D JAGAN	Regulation	R18

LESSON PLAN

Lect No.	Topic	Teaching Aids	Reference
	UNIT - I Fundamentals:		
1.	Need for Low Power Circuit Design	TM1/TM2	T1/R1
2.	Sources of Power Dissipation- Switching Power Dissipation	TM1/TM2	T1/R1
3.	Short Circuit Power Dissipation	TM1/TM2	T1/R1
4.	Leakage Power Dissipation	TM1/TM2	T1/R1
5.	Glitching Power Dissipation	TM1/TM2	T1/R1
6.	Short Channel Effects	TM1/TM2	T1/R1
7.	Drain Induced Barrier Lowering and Punch Through	TM1/TM2	T1/R1
8.	Surface Scattering	TM1/TM2	T1/R1
9.	Velocity Saturation	TM1/TM2	T1/R1
10.	Impact Ionization, Hot Electron Effect	TM1/TM2	T1/R1
	UNIT - II Low-Power Design Approaches:		

11	Low-Power Design through Voltage Scaling	TM1/TM2	T1/R1
12	VTCMOS circuits	TM1/TM2	T1/R1
13	MTCMOS circuits	TM1/TM2	T1/R1
14	Architectural Level Approach- Pipelining and Parallel Processing Approaches	TM1/TM2	T1/R1
15	Switched Capacitance Minimization Approaches:	TM1/TM2	T1/R1
16	System Level Measures	TM1/TM2	T1/R1
17	Circuit Level Measures	TM1/TM2	T1/R1
18	Mask level Measures	TM1/TM2	T1/R1
		TM1/TM2	T1/R1
	UNIT - III Low-Voltage Low-Power Adders:		
19	Introduction	TM1/TM2	T1/R1
20	Standard Adder Cells	TM1/TM2	T1/R1
21	CMOS Adder's Architectures	TM1/TM2	T1/R1
22	Ripple Carry Adders	TM1/TM2	T1/R1
23	Carry Look- Ahead Adders	TM1/TM2	T1/R1
24	Carry Select Adders	TM1/TM2	T1/R1
25	Carry Save Adders	TM1/TM2	T1/R1
26	Low- Voltage Low-Power Design Techniques	TM1/TM2	T1/R1
27	Trends of Technology and Power Supply Voltage	TM1/TM2	T1/R1
28	Low- Voltage Low-Power Logic Styles	TM1/TM2	T1/R1
			T1/R1
	UNIT - IV		

29	Low-Voltage Low-Power Multipliers:	TM1/TM2	T1/R1
30	Introduction	TM1/TM2	T1/R1
31	Overview of Multiplication	TM1/TM2	T1/R1
32	Types of Multiplier Architectures	TM1/TM2	T1/R1
33	Braun Multiplier	TM1/TM2	T1/R1
34	Baugh- Wooley Multiplier	TM1/TM2	T1/R1
35	Booth Multiplier	TM1/TM2	T1/R1
36	Introduction to Wallace Tree Multiplier.	TM1/TM2	T1/R1
	UNIT - V		T1/R1
37	Low-Voltage Low-Power Memories:	TM1/TM2	T1/R1
38	Basics of ROM	TM1/TM2	T1/R1
39	Low-Power ROM Technology	TM1/TM2	T1/R1
40	Future Trend and Development of ROMs	TM1/TM2	T1/R1
41	Basics of SRAM	TM1/TM2	T1/R1
42	Memory Cell	TM1/TM2	T1/R1
43	Precharge and Equalization Circuit	TM1/TM2	T1/R1
44	Low-Power SRAM Technologies	TM1/TM2	T1/R1
45	Basics of DRAM	TM1/TM2	T1/R1
46	Self-Refresh Circuit	TM1/TM2	T1/R1
47	Future Trend and Development of DRAM	TM1/TM2	T1/R1

TM1:Chalk and talk	TM2:PPT	TM3:Seminar	TM4:Webinar
TM5: Lab Demos	TM6:Audio Visual Aids	TM7:Group Discussion	TM8:Field Visits
TM9:3D models	TM10:Puzzle	TM11:Quiz	TM12: Industrial Visits

TM13:Case Study	TM14:FlashCards	TM15:Text BookAssignment	TM16:RolePlay
TM17:Surveys	TM18: Open Text BookTest	TM19: Cross WordPuzzles	TM20: Debates
TM21:Individual Projects			

TEXT BOOKS:

1. CMOS Digital Integrated Circuits – Analysis and Design – Sung-Mo Kang, Yusuf Leblebici, TMH, 2011.
2. Low-Voltage, Low-Power VLSI Subsystems – Kiat-Seng Yeo, Kaushik Roy, TMH Professional Engineering.

REFERENCE BOOKS:

1. Introduction to VLSI Systems: A Logic, Circuit and System Perspective – Ming-BO Lin, CRC Press, 2011
2. Low Power CMOS VLSI Circuit Design – Kaushik Roy, Sharat C. Prasad, John Wiley & Sons, 2000.
3. Practical Low Power Digital VLSI Design – Gary K. Yeap, Kluwer Academic Press, 2002.
4. Leakage in Nanometer CMOS Technologies – Siva G. Narendran, Anatha Chandrakasan, Springer, 2005.