GANDHI SCHOOL OF ENGINEERING

BHABANDHA, BERHAMPUR

BRANCH:- ELECTRONICS & TELECOMMUNICATION ENGINEERING

SEMESTER:- 5TH

SUBJECT:- VLSI & EMBEDDED SYSTEM

Name of the Faculty- ER PRETEESHA MAHAPATRA

			Topic to be taken			Actual topic taken		
Sl. No	Topic/Module	No. of period	Details of the topics	Date	Topic No.	Topic Name	Date	Remarks
1	Introduction to VLSI & MOS Transistor	12	1.1 Historical perspective- Introduction 1.2 Classification of CMOS digital circuit types 1.3 Introduction to MOS Transistor& Basic operation of MOSFET. 1.4 Structure and operation of MOSFET (n-MOS enhancement type) & COMS 1.5 MOSFET V-I characteristics, 1.6 Working of MOSFET capacitances. 1.7 Modelling of MOS Transistors including Basic concept the SPICE level-1 models, the level-2 and level-3 model. 1.8 Flow Circuit design procedures 1.9 VLSI Design Flow & Y chart 1.10 Design Hierarchy 1.11 VLSI design styles-FPGA, Gate Array Design, Standard cells based, Full custom	09/08/2023 TO 28/08/2023	1.1	Historical perspective-Introduction	09/08/2023	
					1.2	Classification of CMOS digital circuit types	10/08/2023	
					1.3	Introduction to MOS Transistor& Basic operation of MOSFET.	11/08/2023	
					1.4	Structure and operation of MOSFET (n-MOS enhancement type) & COMS	14/08/2023 & 16/08/2023	
					1.5	MOSFET V-I characteristics	17/08/2023	
					1.6	Working of MOSFET capacitances.	18/08/2023	
					1.7	Modelling of MOS Transistors including Basic concept the SPICE level-1 models, the level-2 and level-3 model.	21/08/2023 & 23/08/2023	
					1.8	Flow Circuit design procedures	24/08/2023	

					1.9	VLSI Design Flow & Y chart	25/08/2023	
					1.10	Design Hierarchy		
					1.11	VLSI design styles-FPGA, Gate Array Design, Standard cells based, Full custom	28/08/2023	
2	Fabrication of MOSFET	10	2.1 Simplified process sequence for fabrication 2.2 Basic steps in Fabrication processes Flow 2.3 Fabrication process of nMOS Transistor 2.4 CMOS n-well Fabrication Process Flow 2.5 MOS Fabrication process by n-well on p-substrate 2.6 CMOS Fabrication process by P-well on n-substrate 2.7 Layout Design rules 2.8 Stick Diagrams of CMOS inverter	31/08/2023 TO 18/09/2023	2.1	Simplified process sequence for fabrication	31/08/2023	
					2.2	Basic steps in Fabrication processes Flow	01/09/2023	
					2.3	Fabrication process of nMOS Transistor	04/09/2023 & 07/09/2023	
					2.4	CMOS n-well Fabrication Process Flow	08/09/2023 & 11/09/2023	
					2.5	MOS Fabrication process by n-well on p-substrate	13/09/2023	
					2.6	CMOS Fabrication process by P-well on n-substrate	14/09/2023	
					2.7	Layout Design rules	15/09/2023	
					2.8	Stick Diagrams of CMOS inverter	18/09/2023	
3	MOS Inverter	09	3.1 Basic nMOS inverters, 3.2 Working of Resistive-load Inverter 3.3 Inverter with n-Type MOSFET Load – Enhancement Load, Depletion n-MOS inverter 3.4 CMOS inverter – circuit operation and characteristics and interconnect effects: Delay time definitions	21/09/2023 TO 09/10/2023	3.1	Basic nMOS inverters	21/09/2023	
					3.2	Working of Resistive-load Inverter	22/09/2023	
					3.3	Inverter with n-Type MOSFET Load – Enhancement Load, Depletion n-MOS inverter	25/09/2023 & 27/09/2023 & 28/09/2023	

#	Unit	Hrs	Topics	Planned Date	Sub	Sub-topic	Date	
			3.5 CMOS Inventor design with delay constraints – Two sample mask lay out for p-type substrate.		3.4	CMOS inverter – circuit operation and characteristics and interconnect effects: Delay time definitions	04/10/2023 & 05/10/2023	
					3.5	CMOS Inventor design with delay constraints – Two sample mask lay out for p-type substrate.	06/10/2023 & 09/10/2023	
4	Static Combinational, Sequential, Dynamics logic circuits& Memories	15	4.1 Define Static Combinational logic ,working of Static CMOS logic circuits (Two-input NAND Gate) 4.2 CMOS logic circuits (NAND2 Gate) 4.3 CMOS Transmission Gates(Pass gate) 4.4 Complex Logic Circuits - Basics 4.5 Classification of Logic circuits based on their temporal behaviour 4.6 SR Flip latch Circuit, 4.7 Clocked SR latch only. 4.8 CMOS D latch. 4.9 Basic principles of Dynamic Pass Transistor Circuits 4.10 Dynamic RAM, SRAM, 4.11 Flash memory	11/10/2023 TO 16/11/2023	4.1	Define Static Combinational logic ,working of Static CMOS logic circuits (Two-input NAND Gate)	11/10/2023 & 12/10/2023	
					4.2	CMOS logic circuits (NAND2 Gate)	13/10/2023	
					4.3	CMOS Transmission Gates(Pass gate)	16/10/2023	
					4.4	Complex Logic Circuits - Basics	18/10/2023 & 19/10/2023 & 01/11/2023	
					4.5	Classification of Logic circuits based on their temporal behaviour	02/11/2023	
					4.6	SR Flip latch Circuit	03/11/2023	
					4.7	Clocked SR latch only.	06/11/2023	
					4.8	CMOS D latch	08/11/2023	
					4.9	Basic principles of Dynamic Pass Transistor Circuits	09/11/2023 & 10/11/2023	
					4.10	Dynamic RAM, SRAM	15/11/2023	

					4.11	Flash memory	16/11/2023	
5	System Design method & Synthesis	04	5.1 Design Language (SPL & HDL)& HDL & EDA tools & VHDL and packages Xlinx	17/11/2023 & 23/11/2023	5.1	Design Language (SPL & HDL)& HDL & EDA tools & VHDL and packages Xlinx	17/11/2023	
			5.2 Design strategies & concept of FPGA with standard cell based design		5.2	Design strategies & concept of FPGA with standard cell based design	20/11/2023	
			5.3 VHDL for design synthesis using CPLD or FPGA		5.3	VHDL for design synthesis using CPLD or FPGA	22/11/2023	
			5.4 Raspberry Pi - Basic idea		5.4	Raspberry Pi - Basic idea	23/11/2023	
6	Introduction to Embedded Systems	10	6.1 Embedded Systems Overview,list of embedded systems,characteristics ,example – A Digital Camera	24/11/2023 TO 08/12/2023	6.1	Embedded Systems Overview, list of embedded systems, characteristics ,example – A Digital Camera	24/11/2023	
			6.2 Embedded Systems Technologies--Technology – Definition -Technology for Embedded Systems -Processor Technology -IC Technology		6.2	Embedded Systems Technologies--Technology – Definition -Technology for Embedded Systems -Processor Technology -IC Technology	29/11/2023	
			6.3 Design Technology-Processor Technology,General Purpose Processors – Software, Basic Architecture of Single Purpose Processors – Hardware		6.3	Design Technology-Processor Technology, General Purpose Processors – Software, Basic Architecture of Single Purpose Processors – Hardware	30/11/2023 & 01/12/2023	
			6.4 Application – Specific Processors,Microcontrollers,Digital Signal Processors(DSP)		6.4	Application – Specific Processors, Microcontrollers, Digital Signal Processors(DSP)	04/12/2023 & 06/12/2023	
			6.5 IC Technology- Full Custom / VLSI,Semi-Custom ASIC (Gate Array & Standard Cell), PLD (Programmable Logic Device)		6.5	IC Technology- Full Custom / VLSI, Semi-Custom ASIC (Gate Array & Standard Cell), PLD (Programmable Logic Device)	07/12/2023	
			6.6 Basic idea of Arduino micro controller					

				6.6	Basic idea of Arduino micro controller	08/12/2023	

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