2019 Batch.

DHABALESWAR INSTITUTE OF POLYTECHNIC
LESSON PLAN

Discipline .	Semester – V – 21	Name of the Teaching Faculty – Girija Sankar Pradhan
Subject VLSI & Embedded System	No.of days per Week Class Alloted - 4 (Four)	Semester from Dt. 4/10/2021 To Dt. 7/01/2022 No. of Weeks: 14 (fourteen)

Week	Class Day	Theory / Practical Topics
Oct 1st week 2021	1st Day	Historical perspective
	2nd	Classification of CMOS digital circuits
	3rd	Introduction to MOS Transistors and Basic operation of MOSFET
	4th	structure and operation of MOSFET (n-MOS enhancement type) & CMOS
	5th	V-I characteristics of MOSFET
2nd	0	
3rd	1st	Working of MOSFET capacitances
	2nd	Modelling of MOS Transistors SPICE level 1
	3rd	SPICE level 2 and level-3 Model
4th	1st	flow circuit design procedures
	2nd	VLSI design flow & Y-chart
	3rd	Design hierachy
	4th	simplified process for fabrication
	5th	Basic steps in fabrication Process
5th (November)	1st	fabrication process of n-MOS Transistor
	2nd	CMOS n-well fabrication process flow
	3rd	MOS fabrication proces by n-well on p-substrate
	4th	CMOS fabrication process by p-well on a n-substrate
	5th	Lay out Design rules.
6th	1st	Stick diagram of CMOS inverter
	2nd	Basic nMOS inverters.
	3rd	Working of Resistive load inverter
	4th	inverter with n-type MOSFET load Enhancement load, Depletion n-MOS inverter.
7th	1st	CMOS inverter. circuit operation
	2nd	characteristics and interconnect effect
	3rd	Delay time definitions.
	4th	CMOS inverter design with delay constraints.
8th	1st	Two sample mask layout for p-type substrate

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	2nd	static Combinational logic
		Working of static CMOS logic circuits (Two input NAND gate)
	3rd	CMOS logic circuits (NAND & Gate)
	4th	CMOS Transmission gates (Pass gate)
	5th	Complex Logic circuits (Basics)
9th	1st	Classification of Logic circuits based on their temporal behaviour.
	2nd	SR Flip Latch Circuit
December	3rd	Clocked SR Latch only
	4th	CMOS D latch
	5th	Basic principles of Dynamic Pass Transistor circuits
10th	1st	Dynamic RAM, SRAM
	2nd	Flash memory
	3rd	Design Language (SPL & HDL)
	4th	EDA tools & VHDL Xilinx
	5th	Concept of FPGA, standard cell based design.
11th	1st	VHDL for design synthesis using CPLD for FPGA
	2nd	Embedded System Overview, list of embedded systems
	3rd	Characteristics and example — A digital camera
	4th	Embedded System Technologies
	5th	Definition, Processor Technology
12th	1st	IC Technology
	2nd	Design Technology, Processor Technology
	3rd	General Purpose Processors - Software
	4th	Basic Architecture of single purpose
	5th	Processors - Hardware
13th	1st	Application Specific Processors
	2nd	Microcontroller
	3rd	Digital Signal Processors
	4th	IC Technology

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4th (Jan 2022)	1st	VLSI Semi-Custom ASIC (Gate Array & Standard Cell)
	2nd	Programmable Logic Device
	3rd	Basic idea of Arduino microcontrollers.

Siddhartha Nath