BIT POLYTECHNIC,BALASORE

LESSON PLAN

Discipline: Electronics & Telecommunication Engineering	**Semester:** 5th	**Name of the Faculty:** Madhusmita Nayak Lecturer
Subject: VLSI & Embedded System, Theory-2	**No. of Days/week:** 04	

Week	Class Day	Theory Topics
1st	1st	**Unit-1: Introduction to VLSI & MOS Transistor, Historical perspective- Introduction**
	2nd	Classification of CMOS digital circuit types
	3rd	Introduction to MOS Transistor & Basic operation of MOSFET
	4th	Structure and operation of MOSFET (n-MOS enhancement type) & COMS
2nd	1st	MOSFET V-I characteristics, Working of MOSFET capacitances
	2nd	Modeling of MOS Transistors including Basic concept the SPICE level-1 models, the level-2 and level-3 model
	3rd	Flow Circuit design procedures
	4th	VLSI Design Flow & Y chart
3rd	1st	Design Hierarchy, VLSI design styles-FPGA.
	2nd	Gate Array Design, Standard cells based design, Full custom Design.
	3dr	Revision
	4th	Quiz
4th	1st	**Unit-2: Fabrication of MOSFET, Simplified process sequence for fabrication**
	2nd	Basic steps in Fabrication processes Flow
	3dr	Fabrication process of nMOS Transistor
	4th	CMOS n-well Fabrication Process Flow
5th	1st	MOS Fabrication process by n-well on p-substrate
	2nd	CMOS Fabrication process by P-well on n-substrate
	3rd	Layout Design rules
	4th	Stick Diagrams of CMOS inverter

6th	1st	Revision
	2nd	Quiz
	3rd	**MOS Inverter, Basic nMOS inverters.**
	4th	Working of Resistive-load Inverter
7th	1st	Inverter with n-Type MOSFET Load Enhancement Load, Depletion n-MOS inverter
	2nd	CMOS inverter circuit operation and characteristics
	3rd	Interconnect effects Delay time definitions
	4th	CMOS Inventor design with delay constraints Two sample mask lay out for p-type substrate
8th	1st	Revision
	2nd	Quiz
	3rd	**Static Combinational, Sequential, Dynamics logic circuits & Memories, Define Static Combinational logic ,working of Static CMOS, logic circuits (Two-input NAND Gate)**
	4th	CMOS logic circuits (NAND2 Gate)
9th	1st	CMOS Transmission Gates(Pass gate)
	2nd	Complex Logic Circuits - Basics
	3rd	Classification of Logic circuits based on their temporal behavior
	4th	SR Flip latch Circuit, Clocked SR latch only
10th	1st	CMOS D latch
	2nd	Basic principles of Dynamic Pass Transistor Circuits
	3rd	Dynamic RAM, SRAM
	4th	Flash memory
11th	1st	Revision
	2nd	Quiz
	3rd	**System Design method & synthesis, Design Language (SPL & HDL)& HDL & EDA tools**
	4th	VHDL and packages Xylinx
12th	1st	Design strategies & concept of FPGA with standard cell based design
	2nd	VHDL for design synthesis using CPLD or FPGA
	3rd	Raspberry Pi - Basic idea
	4th	Revision
13th	1st	**Introduction to Embedded Systems, Embedded Systems Overview, list of embedded systems, characteristics**
	2nd	A Digital Camera
	3rd	Embedded Systems Technologies--Technology Definition - Technology for Embedded Systems -Processor Technology - IC Technology
	4th	Design Technology-Processor Technology, General Purpose Processors Software, Basic Architecture of Single Purpose Processors Hardware

14th	1st	Application Specific Processors, Microcontrollers, Digital Signal Processors(DSP)
	2nd	IC Technology- Full Custom
	3rd	VLSI, Semi-Custom ASIC (Gate Array & Standard Cell)
	4th	PLD (Programmable Logic Device)
15th	1st	Basic idea of Arduino micro controller
	2nd	Revision
	3rd	Doubt Clearance
	4th	Quiz