Module No.	Unit No.	Topics	Hrs.
1.0		**Review of MOSFET operation and Fabrication**	**08**
	1.1	Overview of VLSI Design Flow, Review of MOSFET operation, MOSFET Capacitances, MOSFET scaling, Short channel effects	03
	1.2	Fabrication process flow of NMOS and CMOS, Lambda based design rules	03
	1.3	Novel MOSFET Architectures FinFET, GAA-FET, CNTFET	02
2.0		**Combinational CMOS Logic Circuits**	**06**
	2.1	CMOS inverter operation, Voltage Transfer characteristics (VTC), Noise Margins, Propagation Delay, Power Dissipation, Design of CMOS Inverter, Layout of CMOS Inverter	03
	2.2	Realization of CMOS NAND gate, NOR gate, Complex CMOS Logic Circuits, Layout of CMOS NAND, NOR and complex CMOS circuits	03
3.0		**MOS Design Logic Styles**	**09**
	3.1	Static CMOS, Pass Transistor Logic, Transmission Gate, Pseudo NMOS, Dynamic Logic, Domino Logic, NORA, Zipper, C^2MOS	04
	3.2	Setup time, Hold time, clocked CMOS SR Latch, CMOS JK Latch, MS –JK Flip Flop, Edge triggered D-Flip Flop and realization using design styles	03
	3.3	Realization of Shift Register, MUX, Decoder using above design styles ,1-bit full adder	02
4.0		**Semiconductor Memories**	**06**
	4.1	ROM array, 6T-SRAM (operation, design strategy, leakage currents, sense amplifier), layout of SRAM	03
	4.2	Operation of 1T and 3T DRAM Cell, NAND and NOR flash memory	03
5.0		**Data path and system design issues**	**06**
	5.1	Ripple carry adder, CLA adder, carry save adder, carry select adder, carry skip adder, Array Multiplier	04
	5.2	On chip clock generation and distribution, Interconnect delay model, interconnect scaling and crosstalk	02
6.0		**RTL Design**	**04**
	6.1	High Level state machines, RTL design process	02
	6.2	RTL design of Soda dispenser machine, FIR Filter	02
		Total	**39**