SARDAR PATEL UNIVERSITY
Programme & Subject: M.Sc (Electronics & Communication)
Semester: III
Syllabus with Effect from: June - 2012

Paper Code: PS03EELC01	Total Credit: 4
Title Of Paper: CMOS Technology and VLSI Design	

Unit	Description in detail	Weightage (%)
I	Introduction to VLSI: complete VLSI design flow (with reference to an EDA tool), Sequential, Data flow, and Structural Modeling. Functions, Procedures, attribute, Test benches, Synthesizable, and non synthesizable statements; packages and configurations Modeling in VHDL with examples of circuits such as counters, shift registers, bi-directional bus, etc	20%
II	Sequential Circuits, Meta-stability Synchronization, Design of Finite State Machines, and State minimization, FSM CASE STUDIES - Traffic Light control, Lift Control and UART STA and DTA Programmable Logic Devices: CPLDs, Study of architecture of CPLD, and Study of the Architecture of FPGA.	20%
III	One, two phase clock, Clock distribution, Power distribution, Power optimization, SRC and DRC, Design validation, Global routing, Switch box routing, Off chip connections, I/O Architectures, Wire parasitics, EMI immune design. Study of memory-Basics of memory includes types of memory cells and memory architectures, Types of memory, based on architecture specific and application specific viz. SRAM, DRAM, SDRAM, FLASH, FIFO.	20%
IV	CMOS parasitics, equivalent circuit, body effect, Technology Scaling, l parameter, Detail study of Inverter Characteristics, power dissipation, power delay product, CMOS combinational logic design and W/L calculations, Transmission gates, Introduction to CMOS layout.	20%

Basic Text & Reference Books:-

- Digital Design, Principles and Practices: John F. Wakerly, Prentice Hall Publication.
- Principles of CMOS VLSI Design: Neil H. E Weste and Kamran Eshraghian.
- Modern VLSI Design: Wyane Wolf.
- Introductory VHDL from simulation to Synthesis: Sudhkar Yalamachalli.
- Digital System Design using VHDL: Charles Roth, McGraw hill.