GUJARAT TECHNOLOGICAL UNIVERSITY

M.E. Semester: III

Power Electronics

Subject Name: **VLSI Circuits and Design (Major Elective-IV)**
Subject Code: **732902**

Sr No.	Course Content
1	**Introduction to VLSI systems:** VLSI design Methodology, design Flow, design Styles, CMOS ICs, Modelling & Simulation, Semiconductor Memories, Computer – aided VLSI design tools.
2	**MOS Transistors:** Introduction, MOSFET Threshold Voltage, MOSFET Current Equation, MOSFET V-I Characteristics, MOSFET Scaling, MOSFET Capacitances, MOSFET Modelling etc.
3	**Analog and digital CMOS design:** Basics, MOSFET Small Signal Model,CMOS Amplifier, Design of CMOS Inverter Gate, Voltage Bootstrapping, Dynamic CMOS Logic Circuit, NORA CMOS Logic etc.
4	**BI-CMOS Technology and Circuits:** Introduction, Comparison between CMOS and BJTs, BICMOS Logic Circuits, Applications of BICMOS Circuits.
5	**VLSI Testing:** Its importance, Design for Testability, Various testing methods VLSI Process: Oxidation, Diffusion, Etching, Photo-lithography, Packing etc.
6	Chip I/O circuits, FPGA, CPLD, ASIC, Estimation & optimization of switching activities, Applications of VLSI design.

Reference Books:

1. VLSI Design by DEBAPRASAD DAS (OXFORD)
2. CMOS Digital Integrated circuits: Analysis and design
   Sung-Mo Kang, Yusuf Leblebici (TATA MCGRAW HILL)
3. VLSI Technology: Sujata Pandey, Manoj Pandey
   (DHANPAT RAI & CO).
4. VHDL by J.Bhaskar. (Pearson).
5. Managing Power Electronics - Rossetti (Wiley).