

GUJARAT TECHNOLOGICAL UNIVERSITY

B.E Semester: 3

Mechatronics Engineering

Subject Code: 130701

Subject Name: DIGITAL LOGIC DESIGN

Sr.No	Course content
1.	Binary System: Digital computer and digital systems, Binary Number, Number base conversion Octal and Hexadecimal Number, complements, Binary Codes, Binary Storage and register, Binary Logic, Integrated Circuit
2.	Boolean Algebra and Logic Gates : Basic Definition, Axiomatic Definition of Boolean Algebra, Basic Theorem and Properties of Boolean Algebra, Minterms And Maxterms, Logic Operations, Digital Logic Gates, IC digital Logic Families
3.	Simplification of Boolean Functions: Different types Map method, Product of sum Simplification, NAND or NOR implementation, Don't Care condition, Tabulation method
4.	Combinational Logic : Introduction, Design Procedure, adder, subtractor, Code Conversion, Universal Gate
5.	Combinational Logic With MSI AND LSI : Introduction, Binary Parallel Adder, Decimal Adder, Magnitude Comparator, Decoder, Multiplexer, ROM, Programmable Logic Array.
6.	Sequential Logic: Introduction, Flip-Flops, Triggering of Flip-Flops, Analysis of Clocked Sequential Circuits, State Reduction and Assignment, Flip-Flop Excitation Tables, Design Procedure, Design of Counters, Design with State Equations
7.	Registers Transfer Logic & Micro-Operation : Introduction, Inter-register Transfer, Arithmetic, logic and shift Micro-Operations, Conditional Control Statements, Fixed-Point Binary Data, overflow, Arithmetic Shifts, Decimal Data, Floating-Point Data, Instruction Codes, Design of Simple Computer
8.	Registers, Counters and the Memory unit : Introduction, Registers, Shift Registers, Ripple Counters, Synchronous Counters, Timing Sequences, Memory Unit

9.	Processor Logic Design : Introduction, Processor Organization, Arithmetic Logic Unit, Design of Arithmetic and logic circuit, Design of ALU. Status Register, Design of shifter, Processor Unit, Design of Accumulator.
10.	Control Logic Design : Introduction, Control Organization, Hard-Wired Control, Micro-Program Control, .

Reference Books:

1. Digital Logic and Computer Design By M Morris Mano
2. Principle of digital Electronics By Malvino & Leach
3. Modern Digital Electronics By R.P.Jain