

Hemchandracharya North Gujarat University, Patan

B.E. SEMESTER – III (CE)

CE302: DIGITAL LOGIC AND DESIGN

Teaching Scheme

Theory	04 Hrs/Week
Tutorial	-
Practical	02 Hrs/Week
Total	06 Hrs/Week

Examination Scheme

Theory	100 Marks
Practical	25 Marks
Term work	25 Marks
Total	150 Marks

- 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