

GUJARAT TECHNOLOGICAL UNIVERSITY

B.E Semester: 3 Biomedical Engineering

Subject Code: 130701

Subject Name: DIGITAL LOGIC DESIGN

| Sr.No | Course content |
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| 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 |

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| 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