

3 rd Semester	RCS3C001	Digital Logic Design	L-T-P 3-0-0	3 CREDITS
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Module-I: (10 Hrs.)

Introduction: Logic design, transistors as switches, CMOS gates, sequential circuits, some examples.

Digital Systems: Representation of numbers, binary codes, Gray code, error-detecting and error-correcting codes, registers, binary logic, basic logic gates.

Boolean Algebra: Boolean operations, Boolean functions, algebraic manipulations, minterms and maxterms, sum-of-products and product-of-sum representations, two-input logic gates, functional completeness.

Module-II: (08 Hrs.)

Minimization of Boolean Functions: Karnaugh map, don't-care conditions, prime implicants, Quine–McCluskey technique, Logic gates, NAND/NOR gates, Universal gates.

Module-III: (10 Hrs.)

Combinational Circuits: Adder, subtractor, multiplier, comparator, decoders, encoders, multiplexers, demultiplexers, MUX Realization of switching functions, Parity bit generator, Code-converters, Hazards and hazard free realizations.

Module-IV: (08 Hrs.)

Synchronous Sequential Circuits: Finite-state machines, latches and flip-flops (SR, D, JK, T), synthesis of clocked sequential circuits, Steps in synchronous sequential circuit design. Design of modulo-N Ring & Shift counters, Serial binary adder.

Module-V: (09 Hrs.)

Registers and Counters: Registers and shift registers, sequential adders, binary and BCD ripple counters, synchronous counters

Algorithmic State Machines: Salient features of the ASM chart-Simple examples-System design using data path and control subsystems-control implementations-examples of Weighing machine and Binary multiplier.

Books:

- Digital Design – Morris Mano, PHI, 3rd Edition, 2006.
- Digital Electronics by G.K. Kharate, Oxford University Press
- Switching & Finite Automata theory – Z. Kohavi, TMH, 2nd Edition.
- An Engineering Approach To Digital Design – Fletcher, PHI.
- Fundamentals of Logic Design – Charles H. Roth, Thomson Publications, 5th Edition, 2004.
- Digital Logic Applications and Design – John M. Yarbrough, Thomson Publications, 2006


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