

**PRASAD V. POTLURI SIDDHARTHA INSTITUTE OF TECHNOLOGY
(AUTONOMOUS)
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING**

I Year B. Tech (CSE) – II Semester

(CS 2T4) DIGITAL LOGIC DESIGN

UNIT – I

Number systems and conversion: Digital systems and Switching circuits, Number systems and conversions, binary Arithmetic, Representation of Negative numbers, Binary codes.

Boolean Algebra: Boolean Operations, Boolean Expressions and truth tables, Basic Theorems , Simplification Theorems , De-Morgan's Laws.

UNIT – II

Boolean algebra and Applications of Boolean Algebra Minterm and Maxterm Expressions: Multiplying out and factoring expressions, EX-OR and equivalence operations, the consensus theorem, algebraic simplifications of switching expressions, proving the validity of an equations.

Applications of Boolean Algebra: conversion of English sentences to Boolean equations, minterms and maxterms expansion

UNIT – III

Karnaugh Maps:Minimum forms of switching functions, Two and Three variable karnaugh maps, four-variable karnaugh maps, minterm and maxterms simplification using k-map,determinations of minimum expressions using essential prime implicants . Quine-Mccluskey method.

UNIT - IV

Combinational Circuit Design: Design of Half-adder ,Full-adder, Full-adder, Full-Subtrator, Ripple adders and Subtrators using 1's and 2's complement method. Serial adder, Carry Look Ahead adder.

UNIT – V

Design of Decoders, Encoders: Multiplexers, De-multiplexers, Higher Order De-multiplexers and Multiplexers, Realization of Boolean Functions Using Decoders and Multiplexers, Priority Encoder, Code Converters, Magnitude Comparator.

UNIT – VI

Introduction to Programmable Logic Devices: Read only Memories, Programmable Logic devices, PLA, PAL, PROM, Realization of Switching Functions Using PROM,PAL and PLA. Comparison of PLA,PAL and PROM.

UNIT – VII

Latches and Flip-Flops: Introduction , SR-Latch, gated D-Latch, Edge Triggered D-Flip Flop, SR Flip-Flop, JK Flip-Flop, T Flip-Flop, Flip-Flop with additional inputs.

UNIT-VIII

Registers and Counters: Registers and Register transfers, Shift registers , Design of binary counters, counters for other sequences, counter design using SR and JK Flip-Flops.

Text Books:

1. Fundamentals of Digital Logic Design By Charles H.Roth, Jr.5th Edition, Cengage
2. Digital Logic and Computer Design By M. Moris Mano.4th Edition

References:

- 1.Digital Principles and Applications By Leach, Paul Malvino. 5th Edition
2. Digital Electronics By G.K.Kharate. Oxford University Press