

DIGITAL LOGIC & COMPUTER ORGANIZATION

Course Code	23ES1304	Year	II	Semester	I
Course Category	Engineering Science	Branch	CSE	Course Type	PC
Credits	3	L – T – P	3-0-0	Prerequisites	Engineering Mathematics, BEEE
Continuous Evaluation:	30	Semester End Evaluation:	70	Total Marks:	100

Course Outcomes

Upon successful completion of the course, the student will be able to:

CO1	Understand the basic concepts of digital circuits, computer functional units of computer system and its organization, computer arithmetic.	L2
CO2	Understand the basic concepts of I/O organization and Processor Organization	L2
CO3	Apply the minimization techniques to simplify Boolean expressions	L3
CO4	Apply the functionality of combinational circuits and sequential circuits.	L3

Syllabus

Unit No.	CONTENTS	Mapped CO
I	Data Representation: Binary Numbers, Number base conversions, Octal and Hexadecimal Numbers, complements of Numbers, Signed binary numbers, Binary codes, Basic Gates Digital Logic Circuits-I: Basic Theorems and Properties of Boolean Algebra, Boolean Functions, Canonical and Standard forms, The Map Method, Four-Variable K-map, Product of Sums simplification, Don't Care Conditions	CO1,CO3
II	Digital Logic Circuits-II: Combinational Circuits, Analysis of Combinational circuits, Binary Adder – Subtractor, Decoders, Encoders, Multiplexers Sequential Circuits – Latches, Flip-Flops, Shift Registers, Ripple counters, Synchronous Counters	CO1,CO4
III	Processor Organization: General Register Organization, Stack Organization, Instruction Formats and Addressing Modes Computer Arithmetic: Addition and Subtraction, Multiplication Algorithms, Decimal Arithmetic Unit, Decimal Arithmetic Operations	CO1,CO2
IV	The Memory Organization: Memory Hierarchy, Main Memory, Auxiliary Memory, Associative Memory, Cache Memory and Virtual Memory	CO1
V	Input/output Organization: Peripheral Devices, Input Output Interface, Asynchronous Data Transfer, Modes of Transfer, Priority Interrupt, DMA	CO2

Learning Resources**Text Books**

1. Digital Design, 6th Edition, M. Morris Mano, Pearson Education.
2. Computer Systems Architecture, M.Moris Mano, Revised 3rd Edition, Pearson
3. Computer Organization, Carl Hamacher, Zvonko Vranesic, Safwat Zaky, 6th edition, McGraw Hill

Reference Books

1. Computer Organization and Design, David A. Paterson, John L.Hennessy, Elsevier
2. Fundamentals of Logic Design, Roth, 5th Edition, Thomson
3. Computer Organization and Architecture, William Stallings, 11th Edition, Pearson.

E-Resources & other digital material

1. <https://nptel.ac.in/courses/117105080>
2. <https://archive.nptel.ac.in/courses/106/105/106105163/>
3. <https://nptel.ac.in/courses/106/103/106103068/>