| II Year II Semester | L | T | P | C |
| :--- | :--- | :--- | :--- | :---: |
| Code: 20ES4106 | 0 | 0 | 3 | 1.5 |

## DIGITAL LOGIC DESIGN LAB

## Course Objectives:

1. Learn the basics of logic gates and implement the Boolean expressions using ICs
2. Study, design and verification of combinational logic circuits and PLDs
3. Study, design and verification of shift registers and counters

Note: The students are required to design the circuit and perform the simulation using Circuit Lab / Equivalent Industrial Standard Licensed simulation software tool. Further they are required to verify the result using necessary hardware equipment.

## List of Experiments:

1. Logic gates - IC7408, IC7432, IC7404, IC7400, IC7402, IC7486

Implementation of Boolean expressions using above ICs
2. Adder \& Subtractor
3. Decoder \& Encoder
4. Multiplexer \& De-multiplexer
5. Magnitude Comparator
6. Realization of Boolean expressions with PROM, PLA/PAL
7. Flip Flops - D, JK, T
8. Universal Shift Register
9. BCD Ripple Counter
10. Up-down Counter
11. Ring Counter
12. Johnson Counter

## Equipment required:

Software:

1. Circuit Lab / Equivalent Industrial Standard Licensed simulation software tool.
2. Computer Systems with required specifications

## Hardware:

1. Trainer kit with inbuilt DC Supply, output LED's, input pulse signals, bread board.
2. Respective IC's.
3. Connecting wires.

## Course Outcomes:

A student who successfully fulfils this course requirement will be able to:

| S.No | Course <br> Outcome | BTL |
| :---: | :--- | :--- |
| 1. | Understand truth tables of logic gates and implement Boolean expressions | L3 |
| 2. | Design and verify basic combinational logic circuits | L5 |


| 3. | Construct and implement PLDs | L5 |
| :---: | :--- | :---: |
| 4. | Verify various flip-flops and shift registers | L4 |
| 5. | Design and verify various counters | L5 |

## Correlation of COs with POs \& PSOs:

| CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| CO 1 | 3 | 2 | 1 | - | 1 | - | - | - | 3 | - | - | - | 2 | 3 | 1 |
| CO 2 | 3 | 3 | 2 | - | 3 | - | - | - | 3 | - | - | - | 2 | 3 | 1 |
| CO 3 | 3 | 2 | 2 | - | 3 | - | - | - | 3 | - | - | - | 3 | 3 | 2 |
| CO 4 | 3 | - | 2 | - | 3 | - | - | - | 3 | - | - | - | 3 | 3 | 2 |
| CO 5 | 3 | 1 | 2 | 1 | 3 | - | - | - | 3 | - | - | - | 3 | 3 | 2 |

