COURSE TITLE	**:**	**DIGITAL COMPUTER PRINCIPLES LAB**
COURSE CODE	**:**	**3138**
COURSE CATEGORY	**:**	**B**
PERIODS/WEEK	**:**	**5**
PERIODS/SEMESTER	**:**	**75**
CREDITS	**:**	**3**

Course General Outcomes:

The student should be able to do the experiments from the following topics on completion of corresponding topic

1.0 To implement basic logic gates

1.0.1 Implement logic gates using basic components

1.0.2 Verify the Logic behaviour of various IC gates: 7408, 7432, 7404, 7400, 7402, 7486)

1.0.3 Implement basic gates using Universal Gates (NAND & NOR)

1.0.4 Simplification of Boolean Functions SOP & POS forms (Demonstrates the relationship between a Boolean Function and the corresponding logic diagram – using Map reduction method)

Eg: Plot the following Boolean function in a Map as well as implement in a logic diagram

F= A'D + BD +B'C + AB'D

2.0 To design and Implement Combinational Circuits

2.0.1 Implement the following Combinational Circuits (Design, construct, and test combinational logic circuit that generates parity bit from four message bits)

2.0.2 Design a combinational circuit that converts a Gray code to binary, Decoder for a binary digit to BCD, and a seven segment indicator

2.0.3 Design, construct, and test a half-adder & a full-adder Implement using Basic gates and Universal gates

2.0.4 Implement a circuit using a four-bit binary parallel adder (IC 7483) implement Adder-Subtractor, and a Magnitude Comparator)

3.0 To demonstrate synchronous sequential logic

3.0.1 Construct, Test, and investigate the operation of SR Latch, D Latch, Master-Slave Flip-Flop, Edge-Triggered Flip-Flop, IC Flip-Flops(using IC 7476, and 7474)

3.0.2 Sequential Circuits (Design, construct, and test Up-Down counter with Enable)

3.0.3 Design, construct, and test a counter that goes through a sequence of binary states (User controlled counting pattern)

3.0.4 Construct, and test Ripple Counter, Synchronous counter, Decimal Counter

3.0.5 Setup a Binary counter with Parallel Load (use IC 74161))

3.0.6 Study the operation of Shift Registers (Investigate the operation of Shift Registers, Ring Counter, Feedback Shift Register, Bidirectional Shift register, Bidirectional Shift Register with Parallel Load)