# Prasad.V.Potluri Siddhartha Institute of Technology, Kanuru, Vijayawada

# Fundamentals of Digital Logic Design

# (Common with CSE)

Course Code	19IT3301	Year	II	Semester	Ι
<b>Course Category</b>	PC	Branch	IT	<b>Course Type</b>	Theory
Credits	3	L-T-P	3-0-0	Prerequisites	
<b>Continuous Internal</b>		Semester End			
<b>Evaluation :</b>	30	<b>Evaluation:</b>	70	<b>Total Marks:</b>	100

	Blooms Taxonomy Level	
Upon suc		
CO1	Understand various types of number systems and their conversions.	L2
CO2	Apply different methods to simplify Boolean functions.	L3
CO3	Design Combinational logic circuits.	L3
CO4	Design sequential circuits using flip-flops.	L3
CO5	Construct Registers and Counters using flip-flops.	L3

	Contribution of Course Outcomes towards achievement of Program Outcomes & Strength of correlations (3:Substantial, 2: Moderate, 1:Slight)									n of				
	PO 1	PO 2	PO 3	PO 4	РО 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
CO 1	2													
CO 2	2	1											2	1
CO 3	2	2	2										2	1
CO 4	2	2	2										2	1
CO 5	2	2	2										2	1

	Syllabus				
Unit No	Contents				
I	<b>Digital Systems and Binary Numbers:</b> Decimal, Octal, Hexadecimal number systems, Conversions, Complements, Binary codes, Arithmetic with signed and unsigned numbers (addition, subtraction), Logic Gates.	CO1			
п	<ul> <li>Boolean Algebra: Introduction, Axioms and Laws of Boolean</li> <li>Algebra, Boolean functions, Minterms (SOP) and Maxterms (POS),</li> <li>Canonical and Standard Forms</li> <li>Gate–Level Minimization: Introduction, Two, Three, Four Variable</li> <li>K-map's, Don't Care Conditions, NAND and NOR implementation.</li> </ul>	CO2			
III	<b>Combinational Logic:</b> Introduction to combinational logic circuits, Binary adder and subtractor, Look Ahead Carry Adder, Decoders, Encoders, Multiplexers, Demultiplexers.	CO3			
IV	<b>Sequential Logic:</b> Introduction to sequential circuits, Latch–Flip Flop–SR, JK, T, D Flip Flops–Flip Flop excitation tables.	CO4			
V	<b>Registers and Counters:</b> Registers, Shift registers, Synchronous and Asynchronous (ripple) counters, BCD counter (synchronous and asynchronous), Ring counter, Johnson counter.	C05			

### Learning Recourses

#### **Text Books**

1. Digital Design, M. Morris Mano, Michael D.Ciletti, Fifth Edition, 2013, Pearson.

### References

- 1. Switching Theory and Finite Automata, Zvi. Kohavi, Niraj K. Jha, Third Edition, 2010, Cambridge, University Press.
- 2. Fundamentals of Digital circuits, A. Anand Kumar, Third Edition, 2013, PHI.

e-Resources & other digital material

- 1. <u>https://nptel.ac.in/courses/106/108/106108099/</u> http://nptel.ac.in/courses/117106086/1
- 2. <u>https://nptel.ac.in/courses/117/105/117105080/</u>
- 3. https://www.udemy.com/course/digital-electronics-logic-design/
- 4. <u>https://learnabout-electronics.org/Digital/dig20.php</u>
- 5. https://www.tutorialspoint.com/digital circuits/digital circuits logic gates.htm
- 6. <u>https://www.geeksforgeeks.org/digital-electronics-logic-design-tutorials/</u>