19CS3301

Fundamentals of DigitalLogic Design

Course Code	19CS3301	**Year**	II	**Semester**	I
Course Category	Program Core	**Branch**	CSE	**Course Type**	Theory
Credits	3	**L-T-P**	3-0-0	**Prerequisites**	Basic number System, Basic Electrical & Electronics Engg. (19ES1201)
Continuous Internal 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.	**L2**
CO2	Apply minimization techniques to simplify Boolean expressions.	**L3**
CO3	Apply the principles of digital electronics to design combinational and sequential circuits.	**L3**
CO4	Analyze the functionality of combinational circuits.	**L4**

Contribution of Course Outcomes towards achievement of Program Outcomes & Strength of correlations (3:Substantial, 2: Moderate, 1:Slight)													
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	3													
CO2	2													
CO3	3												3	
CO4		3							3	3				

	Course Content	
UNIT-1	**Digital Systems and Binary Numbers:** Decimal, Octal, Hexadecimal number systems, Conversions, Complements, Binary codes, Arithmetic with signed and unsigned numbers (addition, subtraction), Logic Gates.	**CO1**
UNIT-2	**Boolean Algebra:** Introduction, Axioms and Laws of Boolean Algebra, Boolean functions, Minterms (SOP) and Maxterms (POS), Canonical and Standard Forms **Gate–Level Minimization**:Introduction, Two, Three, Four Variable K-map's, Don't Care Conditions, NAND and NOR implementation.	**CO1,CO2**
UNIT-3	**Combinational Logic:** Introduction to combinational logic circuits, Binary adder and subtractor, Look Ahead Carry Adder, Decoders, Encoders, Multiplexers, Demultiplexers.	**CO1,CO3,CO4**
UNIT-4	**Sequential Logic:** Introduction to sequential circuits, Latch–Flip Flop–SR, JK, T, D Flip Flops–Flip Flop excitation tables.	**CO1,CO3**
UNIT-5	**Registers and Counters:** Registers, Shift registers, Synchronous and Asynchronous (ripple) counters, BCD counter (synchronous and asynchronous), Ring counter, Johnson counter.	**CO1,CO3**
	Learning Resources	
Text Books	1. Digital Design, M. Morris Mano, Michael D.Ciletti, Fifth Edition, 2013, Pearson.	
Reference Books	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, ThirdEdition, 2013, PHI.	
e- Resources & other digital material	1. https://nptel.ac.in/courses/106/108/106108099/ 2. http://nptel.ac.in/courses/117106086/1 3. https://nptel.ac.in/courses/117/105/117105080/ 4. https://www.udemy.com/course/digital-electronics-logic-design/ 5. https://learnabout-electronics.org/Digital/dig20.php 6. https://www.tutorialspoint.com/digital_circuits/digital_circuits_logic_gates.htm 7. https://www.geeksforgeeks.org/digital-electronics-logic-design-tutorials/	