LESSON PLAN
(PVPSIT/ACD /01)

Academic Year : 2023-24
Year/Semester/Section : II B.Tech I SEM/S1, S2 and S3
Branch : Computer Science and Engineering (CSE)
Subject Code & Name : 20CS3301 – Fundamentals of Digital Logic Design
Name of Faculty : Ms. P. Dedeepya /Ms. Y. Manasa/ Mr. P. Anil Kumar

COs	Course Outcomes	Cognitive Level
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 and Sequential Circuits.	**L4**

Unit No.	Topic of syllabus to be covered	Learning out comes	Lecture/ Tutorial (L/T)	Teaching Mode (BB/LCD)	Total No. of Cumulative Hours	Expected date of Topic to be covered	Review/ Remarks (By HOD)
I	**Digital Systems and Binary Numbers: Digital Systems**	Introduction about course outcomes. Understand about Digital System and Analog System**.(CO1-L2)**	L	**BB/LCD**	1		
I	Binary Numbers ,Number Base Conversions	Understand about Binary Number System. **(CO1-L2),** Understand about conversion of one number system to other numbers system-Binary, Decimal conversions. **(CO1-L2)**	L	**BB/LCD**	3		
I	Octal and Hexadecimal Numbers	Understand about octal and Hexa decimal number system conversions.**(CO1-L2)**	L	**BB/LCD**	4		

I	Complements of Numbers	Understand about Subtraction with Complements-1's,2's, 9's and 10's complements subtraction.**(CO1-L2)**	L	**BB/LCD**	5		
I	Signed Binary Numbers	Understand about Signed Binary Numbers-Arithmetic Addition Arithmetic Subtraction.**(CO1-L2)**	L	**BB/LCD**	6		
I	Binary codes	Understand about Binary codes-Binary-Coded Decimal Code, BCD Addition, Subtraction.**(CO1-L2)**	L	**BB/LCD**	7		
I	Binary codes	Understand aboutExcess-3 Code and Gray Code.**(CO1-L2)**	L	**BB/LCD**	8		
I	Binary Logic	Understand about Binary Logic-Definition of Binary Logic, Logic Gates- Basic Gates and Truth Tables. **(CO1-L2)**	L	**BB/LCD**	9		
I	**Quiz on UNIT-I**				10		
II	**<u>Boolean Algebra:</u>** **Introduction,** Basic Definitions, Axiomatic definition of Boolean Algebra	Discuss about Boolean Algebra-Introduction, Basic Definitions, Axiomatic definition of Boolean Algebra - Two-Valued Boolean Algebra. **(CO2-L2)**	L	**BB/LCD**	11		
II	Basic theorems and properties of Boolean Algebra	Discuss about Basic theorems and properties of Boolean Algebra –Duality, Basic Theorems. **(CO2-L2)**	L	**BB/LCD**	12		
II	Boolean functions	Discuss about **Boolean functions**-Algebraic Manipulation, Complement of a Function. **(CO2-L2)**	L	**BB/LCD**	13		
II	Canonical and Standard Forms	Apply the following concepts: Canonical and Standard Forms Minterms and Maxterms, Sum of Minterms (SOP) to simplify the Boolean function. **(CO2-L3)**	L	**BB/LCD**	14		
II	Canonical and Standard Forms	Apply the following concepts Product	L	**BB/LCD**	15		

		of Maxterms (POS) to simplify the Boolean function.**(CO2-L3)**					
II	Canonical and Standard Forms	Discuss about Conversion between Canonical Forms, Standard Forms.***(*CO2-L3*)***	L	**BB/LCD**	16		
II	**Gate–Level Minimization: Introduction,Map Method**	Demonstrate on Introduction of Map Method:-Two-Variable K-Map, Three-Variable K-Map. **(CO2-L3)**	L	**BB/LCD**	17		
II	**Map Method** Four Variable K-Map	Apply the Karnaugh map or K-map of Two-Variable K-Map or Three-Variable K-Map Method to minimize the Boolean function. **(CO2-L3)**	L	**BB/LCD**	18		
II		Apply the Karnaugh map or K-map-of Four Variable K-Map Method to minimize the Boolean function.	L	**BB/LCD**			
II	Product of Sums Simplification	Simplify the product of sums using K-Map Method. **(CO2-L3)**	L	**BB/LCD**	19		
II	Don't Care Conditions	Using Don't Care Conditions to simplify the Boolean output expression of a digital circuit.**(CO2-L3)**	L	**BB/LCD**	20		
II	NAND and NOR implementation	NAND and NOR gates in the design of digital circuits, rules and procedures have been developed for the conversion from Boolean functions given in terms of AND, OR, and NOT into equivalent NAND and NOR logic diagrams. **(CO2-L3)**	L	**BB/LCD**	21		
	Flip Class				22		
III	**Combinational Logic:** Introduction, Combinational Circuit,Analysis Procedure	Demonstrate on Combinational Logic: Introduction,Combinational Circuit,Analysis Procedure.**(CO3-L2)**	L	**BB/LCD**	23		
III	Design Procedure	Explain about the Design Procedure of Combinational Circuit Code Conversion Example.**(CO3-L2)**	L	**BB/LCD**	24		
III	Binary adder – subtractor	Design a combinational circuit using	L	**BB/LCD**	25		

		Binary Adders –Half Adder, Full Adder. **(CO3-L3)**					
III	Binary adder – subtractor	Design a combinational circuit using Binary Subtractor- Half Subtractor, Full Subtractor. **(CO3-L3)**	L	**BB/LCD**	26		
III	Decimal Adder	Construct a BCD adder–subtractor circuit using the BCD adder. (**CO3-L3)**	L	**BB/LCD**	27		
III	BCD to Seven Segment Display	Using a truth table and Karnaugh maps, design the BCD-to-seven-segment decoder using a minimum number of gates. **(CO3-L3)**	L	**BB/LCD**	28		
III	Encoders, Decoder	Design a combinational circuit using Encoders- Decoder.**(CO3-L3)**	L	**BB/LCD**	29		
III	Priority Encoder	Design a Combinational Circuit using Priority Encoder.**(CO3-L3)**	L	**BB/LCD**	30		
III	Multiplexers, Demultiplexers	Implement a Boolean functions, adders and subtractor using Multiplexers, Demultiplexers. **(CO3-L3)**	L	**BB/LCD**	31		
III	Examples on Encoders, Decoder, Multiplexers, Demultiplexers	Practicing more problems on Encoders, Decoder, Multiplexers, and Demultiplexers. **(CO3-L3)**	L	**BB/LCD**	32		
IV	**Synchronous Sequential Logic:** **Introduction**	Understand about the Sequential circuits and distinguish the sequential logic from combinational logic. **(CO3-L2)**	L	**BB/LCD**	33		
IV	Storage Elements :Latches, Flip-Flops	Construct a SR Latch, D Latch using logical gates. **(CO3-L3)**	L	**BB/LCD**	34		
IV	SR Flip Flop	Design a sequential circuit using SR Flip Flop. **(CO3-L3)**	L	**BB/LCD**	35		
IV	JK Flip Flop	Design a sequential circuit using JK Flip Flop. **(CO3-L3)**	L	**BB/LCD**			
IV	D Flip Flop, T Flip Flop	Design a sequential circuit using D Flip Flop, T Flip Flop. **(CO3-L3)**	L	**BB/LCD**	36		
IV	Flip Flop Conversions	Design a Sequential Circuit to covert the Flip Flops**(CO3-L3)**	L	**BB/LCD**	37		

IV	Characteristic Tables, Characteristic Equations, Excitation Table	Explain the differences among a truth table, a state table, a characteristic table, and an excitation table.**(CO3-L3)**	L	**BB/LCD**	38		
V	**Registers :** Register with Parallel Load	Understand aboutRegisters -Register with Parallel Load. **(CO4-L2)**	L	**BB/LCD**	39		
V	**Shift Registers**	Compare Combinational and Sequential Circuits, discuss about shift registers. **(CO4-L4)**	L	**BB/LCD**	40		
V	**Shift Registers-** Serial Transfer, Serial Addition, Universal Shift Register	Understand the concepts of Shift Registers- Serial Transfer, Serial Addition, and Universal Shift Register. **(CO4-L2)**	L	**BB/LCD**	41		
V	**Ripple Counters-** Binary Ripple Counter	Design binary ripple counter using flip-flops. **(CO4-L3)**	L	**BB/LCD**	42		
V	**Ripple Counters-** BCD Ripple Counter	Construct a BCD ripple counter using other counters. **(CO4-L3)**	L	**BB/LCD**			
V	**Synchronous Counters-** Binary Counter, Up–Down Binary Counter	Design - Binary Counter, Up–Down Binary Counter using flip-flops. **(CO4-L3)**	L	**BB/LCD**	43		
V	**Synchronous Counters-** BCD Counter, Binary Counter with Parallel Load	Design - BCD Counter, Binary Counter with Parallel Load using flip-flops. **(CO4-L3)**	L	**BB/LCD**	44		
V	**Other Counters-** Ring counter, Johnson counter.	Design Ring counter, Johnson counter using Flip Flops. **(CO4-L3)**	L	**BB/LCD**	45		

Legend: Teaching Mode **BB**: Black Board / LCD: Power Point Presentation

Signature of the Faculty

Signature of the HOD

1. **Ms. P. Dedeepya**
2. **Ms. Y. Manasa**
3. **Mr.P.Anil Kumar**