Digital Logic Design

Course Code	20EC3302	**Year**	II	**Semester**	I
Course Category	Program Core	**Branch**	ECE	**Course Type**	Theory
Credits	3	**L-T-P**	3-0-0	**Prerequisites**	Nil
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	Illustrate Binary arithmetic operations using Complements
CO2	Construct Logic gate circuits for given Boolean functions
CO3	Simplify Boolean functions using Boolean Theorems, K-map & Tabulation Methods
CO4	Analyze various Combinational and Sequential circuits
CO5	Design Combinational and Sequential circuits for the given specifications

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Mapping of course outcomes with Program outcomes (CO/ PO/PSO Matrix)

Note: 1- Weak correlation 2-Medium correlation 3-Strong correlation

* - Average value indicates course correlation strength with mapped PO

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2												1	
CO2	2												1	
CO3		2							2				2	
CO4		3							3				2	
CO5			3						3				2	
Avg.	2	3	3						3				2	

Syllabus		
Unit No.	**Contents**	**Mapped CO**
1	**Binary Codes**: Signed Binary Numbers, Complements, Binary Codes, Error detection and correction code, Binary Logic. **Boolean Algebra**: Basic definitions, Axiomatic definition of Boolean algebra, Basic theorems and properties of Boolean algebra, Boolean functions, Canonical and Standard forms, Digital logic gates.	CO1, -CO3
2	**Simplification of Boolean functions**: The map method, Four-variable map, Five-variable map, Tabulation Method, Product of sums simplification, Don't-care conditions, NAND and NOR implementation.	CO2, CO3
3	**Combinational Logic**: Introduction, Design procedure, Half adder, Full Adder, Binary Adder/Subtractor, Decoders, Encoders, Multiplexers, De-Multiplexer, Code Converters.	CO2, CO4, CO5
4	**Sequential Logic**: Latches, Flip-Flops, Excitation tables of Flip-	CO2,

	flops, Conversion from one flip-flop to another, Registers, Shift registers, Ripple counters, Design of Synchronous Counters, Ring counter.	CO4, CO5
5	**Synchronous Sequential Machines**: Analysis of clocked sequential circuits, Mealy and Moore models, State reduction and assignment, Design procedure, Design and realization of circuits using various Flip-flops.	CO2, CO4, CO5

Learning Resources
Text Books
1. Michael D. Ciletti, M. Morris Mano, Digital Design, 4th Ed., Pearson Education, 2007.
Reference Books
1. Zvi Kohavi, Switching and Finite Automata Theory, 2nd Ed., Tata Mc-Graw-Hill Education, 2008. 2. John F. Wakerly, Digital Design Principles and Practices, 4th Ed., Pearson Education, 2008. 3. Frederick J. Hill and Gerald R. Peterson, Introduction to Switching Theory and Logic Design, 3rd Ed., John Willey and Sons, 1981. 4. Charles Roth, Jr., Larry Kinney, Fundamentals of Logic Design, 7th Ed., Cengage Learning, India, 2013.
e- Resources & other digital material
1. http://www.ece.ubc.ca/~saifz/eece256.html 2. http://nptel.iitm.ac.in/courses/Webcourse-contents/IIT%20Guwahati/digital_circuit /frame/index.html