Digital Electronics

Course Code	23EC5501	Year	III	Semester	I
Course Category	Minors	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		BL
CO1	Perform Binary arithmetic operations using Complements and identify Binary Codes.	L3
CO2	Implement Switching Functions using Logic Gates.	L3
CO3	Apply Boolean theorems & K-Map to simplify the Switching Functions.	L3
CO4	Analyse various Combinational and Sequential circuits.	L4
CO5	Design Combinational and Sequential circuits for the given specifications.	L4

COs	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO9	PO10	PO11	PSO 1	PSO 2
CO1	2								1		1		
CO2	2								1		1		
CO3	2								1		1		
CO4		3							1		1	2	
CO5			3						1		1	2	1
Avg.	2	3	3						1		1	2	1

Syllabus		
Unit No.	Contents	Mapped CO
1	**Binary Codes**: Signed Binary Numbers, Complements, 84-2-1 code, 642-3 code, 2421 code, BCD code, Gray code, Excee-3 code, **Boolean Algebra**: Basic theorems and Properties of Boolean algebra, Algebraic simplification of Switching Functions, Digital Logic Gates.	CO1, CO3
2	**Switching Functions**: Canonical and Standard forms, Simplification of switching functions using K-map method, Four-variable map, Don't-care conditions.	CO2,CO3
3	**Combinational Logic Circuits**: Introduction, Design procedure, Half adder, Full Adder, Half Subtractor, Full Subtractor, Decoders, Encoders, Multiplexers , De-Multiplexers, Realization of Boolean functions using Decoders and Multiplexers.	CO2, CO4, CO5
4	**Sequential Logic Circuits**: Latches, Flip-Flops, Excitation tables of Flip-flops, Conversion from one flip-flop to another, Ripple counters, Design of Synchronous Counters.	CO2,CO4, CO5
5	**Synchronous Sequential Machines**: Analysis of Clocked Sequential Circuits, State diagrams, State tables, Mealy and Moore models.	CO2,CO4, CO5

Learning Resources
Text Books
1. Michael D. Ciletti, M. Morris Mano, Digital Design, Pearson Education, 4th Ed., 2007.
Reference Books
1. Zvi Kohavi, Switching and Finite Automata Theory, 2nd Ed, Tata McGraw-Hill Education, 2008. 2. John F. Wakerly, Digital Design Principles and Practices, Pearson Education, 4th Ed., 2008. 3. Charles Roth, Jr., Larry Kinney, Fundamentals of Logic Design, Cengage Learning, India, 7th Ed., 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