



GUJARAT TECHNOLOGICAL UNIVERSITY

Syllabus for Integrated MSc, 3rd Semester

Branch: Information Technology

Subject Name: Digital Electronics

Subject Code: 1330504

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks				Total Marks
L	T	P		Theory Marks		Practical Marks		
			ESE(E)	PA (M)	PA (I)	ESE (V)		
3	0	2	4	70	30	20	30	150

Course Content:

Sr No.	Content	Teaching Hours	Module Weightage (%)
1	Number systems and codes: Binary, octal, hexadecimal and decimal Number systems and their inter conversion, BCD numbers, BCD, XS-3, Gray code, alphanumeric codes, Error detecting and error correcting codes.	07	10
2	Logic gates and Boolean algebra: Logic gates (AND, OR, NOT, NAND, NOR, Ex-OR, ExNOR and their truth tables), universal gates, Basic theorems and Properties, canonical and standard forms (SOP and POS forms), Simplification by Boolean theorems, Karnaugh Map, don't care condition	07	20
3	Combinational Logic: The Half adder, the full adder, subtractor circuit, Parallel Binary adders, magnitude Comparator, code conversion, Multiplexer, de-multiplexer, decoder, Encoders	07	20
4	Sequential Logic: latches, D-flipflop, R-S flip-flop, J-K Flip-flop, Master slave Flip flop, edge triggered flip-flop, T flip-flop.	07	20
5	Registers and Counters: Serial in-Serial out shift register, Serial in-Serial out shift register, Serial in-parallel out shift register, parallel in-parallel out shift register, parallel in-Serial out shift register, Bi-directional register, concept of synchronous and asynchronous counter, Binary up counter, binary down counter	07	20
6	Memory and storage: Classification and characteristics of memories, read only memory (ROM), read and write memory (RAM), Programmable ROMs, The Flash Memory, Memory Expansion, Special Types of Memories, Magnetic and Optical Storage.	05	10

Suggested Specification table with Marks (Theory):

Distribution of Theory Marks				
R Level	U Level	A Level	N Level	E Level
30	20	20	-	-



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Legends: R: Remembrance; U: Understanding; A: Application, N: Analyze and E: Evaluate and above Levels (Bloom's Taxonomy)

Reference Books:

1. "Digital logic and Computer design", M. M. Mano, Pearson Education India
2. "Fundamental of digital circuits", by A.ANANDKUMAR, PHI Publication
3. "Digital Principles and Applications", Malvino & Leach, McGraw-Hill Education
4. "Modern Digital Electronics", R.P.Jain, McGraw Hill Education

Sr. No.	CO statement
CO-1	Solve the given problem using fundamentals of Number systems
CO-2	Solve the given problem using Boolean algebra and design various circuits using gates
CO-3	Design and implement Combinational logic circuits and verify its working
CO-4	Design and implement Sequential logic circuits like flip flops, counters, registers and verify its working
CO-5	Comprehend different types of memories