

GANPAT UNIVERSITY									
FACULTY OF ENGINEERING AND TECHNOLOGY (DIPLOMA PROGRAMMES)									
Programme		Diploma Engineering			Branch/Spec.		Computer Engineering / Information Technology		
Semester		II			Version		1.0.0.0		
Effective from Academic Year			2018-19		Effective for the batch Admitted in			June 2018	
Subject code		1ES108	Subject Name		Fundamentals of Digital Electronics				
Teaching scheme					Examination scheme (Marks)				
(Per week)	Lecture(DT)		Practical(Lab.)		Total		CE	SEE	Total
	L	TU	P	TW					
Credit	3	0	1	0	4	Theory	40	60	100
Hours	3	0	2	0	5	Practical	30	20	50
Pre-requisites:									
None									
Learning Outcome:									
I. To learn various number systems and their conversion used in digital components									
II. To design logic functions using logic gates									
III. To implement logic functions using Boolean algebra and K-map simplifications									
IV. To understand basic digital components for circuit design									
Theory syllabus									
Unit	Content								Hrs
1	<b>BINARY SYSTEMS</b> Binary Numbers, Types of Number System (Binary, Octal, Decimal, Hexa-Decimal), Number Base conversions, Binary Complement Methods, Binary codes (BCD, XS-3, Parity, Gray Code)								10
2	<b>LOGIC GATES</b> Binary Logic, Basic Logic Gates (AND, OR, NOT), Derived Logic Gates (XOR, XNOR), Universal Logic Gates (NAND, NOR), Logic Diagrams using Basic Logic Gates, Logic Gate IC Pin Diagram.								8
3	<b>BOOLEAN ALGEBRA</b> Postulates, Laws of Boolean Algebra, De-Morgan's Theorems, Basic Boolean Simplifications, Sum of Product, Product of Sum, Min term, Max term, Standard Forms, Canonical Forms.								8
4	<b>K-MAP SIMPLIFICATIONS</b> K-map (Two Variable, Three Variable, Four Variable), Don't Care Condition, Simplification of Boolean Function using K-map, Implement using NAND gate, Implement using NOR gate.								9
5	<b>COMBINATIONAL LOGIC</b> Half Adder, Full Adder, Half Subtractor, Full Subtractor, Magnitude Comparator, Decoder, Encoder, Multiplexer, De-Multiplexer.								10
Practical content									

1. Conversion of Number System
2. Realize the basic logic gates.
3. Prove De-Morgan's Theorem.
4. Realize the NAND gate as a universal Gate
5. Realize the NOR gate as a universal Gate
6. Design and implement Half Adder
7. Design and implement Full Adder
8. Design and implement Half Subtractor
9. Design and implement Full Subtractor
10. Realize the Binary Parallel Adder
11. Realize 4:1 Multiplexer
12. Realize 1:4 Demultiplexer
13. Realize 2:4 Decoder
14. Realize 4:2 Encoder

Text Books	
1	Digital Logic and Computer Design, Morris Mano, Pearson Publication
Reference Books	
1	Modern Digital Electronic, R. P. Jain, TMH
2	Digital electronics Principles, Malvino& Leech, TMH
3	Fundamentals of Digital Circuits, Anand Kumar, PHI