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	1ES206	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	**BINARY SYSTEMS** 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	**LOGIC GATES** 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	**BOOLEAN ALGEBRA** 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	**K-MAP SIMPLIFICATIONS** 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	**COMBINATIONAL LOGIC** 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