

GANPAT UNIVERSITY												
FACULTY OF ENGINEERING & TECHNOLOGY												
Programme	Bachelor of Technology				Branch /Spec.	Computer Science & Engineering Computer Science & Engineering (Big Data and Analytics) Computer Science & Engineering (Cyber Security) Computer Science & Engineering (Artificial Intelligence and Machine Learning)						
Semester	I				Version	1.0.0.0						
Course Code	2ESC1115				Course Name	DIGITAL ELECTRONICS						
Effective from Academic Year	2026-27				Effective for the batch Admitted in	July 2026						
Course Category	ESC											
Teaching, Learning and Examination Scheme												
Teaching & Learning Scheme							Examination scheme (Marks)					
Hours (per week)				Cr	SL	TS L	Theory			Practical		
L	TU	P	TTH				CE	SEE	Total	CE	SEE	Total
3	0	2	5	04	45	120	50	50	100	25	25	50
L: Lecture, TU: Tutorial, P: Practical, TTH: Total Teaching Hours/Week, Cr: Credit, SL: Min. Self Learning/Term Work Hours/Sem, TSL: Min. Total Teaching & Learning Hours/Sem, CE: Continuous Evaluation, SEE: Semester End Examination,												
Pre-requisites												
Fundamental knowledge of physics during 11 th and 12 th science.												
Course Outcomes												
COs	Description											
CO1	Learn the basics of Number systems.											
CO2	Understand the basics of Boolean functions & logic Gates.											
CO3	Design different types of combinational digital logic circuits.											
CO4	Develop sequential logic circuits for various applications.											
Theory Syllabus												
Unit	Content											Hrs
1	Binary Systems : Digital Computer & Systems, Binary Numbers, Number Base conversions, Different Number systems & their relations, Complements, Binary codes, Binary storage & registers.											8
2	Boolean Algebra & Logic Gates : Basic definitions, Axiomatic definition of Boolean Algebra, Basic Theorems & Properties, Boolean functions, Canonical & Standard forms, Logic operations, Digital Logic gates & Logic families.											5
3	Simplification of Boolean Functions : Map method, Two, Three, Four, Five & Six variable maps, Products of Sum & Sum of Products simplification, NAND, NOR & Other two level Implementations, Don't care conditions, Tabulation method.											8
4	Combinational Logic : Design Procedure, Address, Subtractors, Code Conversion, Analysis Procedure, Multilevel NAND & NOR circuits, Exclusive-OR & Equivalence functions.											8
5	Combinational Logic with MSI & LSI : Binary Parallel Adder, Decimal Adder, Magnitude Comparator, Decoders, Multiplexers.											6
6	Sequential Logic : Flip Flops, Triggering of Flip Flops, Analysis of clocked sequential circuits, Flip Flop Excitation tables, Design of Sequential circuits, Design of counters, Introduction to registers											10
Practical Content												
Practicals shall be based on Building & testing circuits on bread board and software for basic logic gates, elementary level circuits using gates, Application circuits using Universal Gates, Verification of different Laws and theorems, various combinational circuit designs and their testing on breadboard. Understanding & testing behaviour of circuits using readily available kits and software for medium and large level circuits.												
Text Books												

1	Digital Logic and Computer Design by Morris Mano													
Reference Books														
1	Digital Fundamentals by Floyd													
2	Digital Electronics by R. P. Jain													
3	Fundamental of Digital Circuits by A. Anandkumar													
ICT/MOOCs Reference														
1	Course name : Digital Circuits https://nptel.ac.in/courses/108105113													
Mapping of Cos, POs, and PSOs														
COs	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PSO 1	PSO 2	PSO 3
CO1	2	1	2	1	1	0	0	2	0	1	2	1	1	1
CO2	2	3	3	3	2	2	0	2	1	3	3	1	2	2
CO3	3	3	3	3	3	2	2	3	1	3	3	2	2	3
CO4	3	3	3	3	3	2	2	3	1	3	3	2	3	3
Unit	Unit Title								Aligned COs	Learning Hours	BTL Level			
1	Binary Systems								1	8	R,U			
2	Boolean Algebra & Logic Gates								2	5	R,U,A			
3	Simplification of Boolean Functions								2	8	U,A,N			
4	Combinational Logic								3	8	U,A,N			
5	Combinational Logic with MSI & LSI								3	6	A,N,E			
6	Sequential Logic								4	10	A,N,E,C			

Note:

- Version 1.0.0.0 (First Digit= New syllabus/Revision in Full Syllabus, Second Digit=Revision in Teaching Scheme, Third Digit=Revision in Exam Scheme, Forth Digit= Content Revision)
- L=Lecture, TU=Tutorial, P= Practical/Lab., TW= Term work, DT= Direct Teaching, Lab.= Laboratory work
CE= Continuous Evaluation, SEE= Semester End Examination
- 1 Hour Lecture = 1 Credit, 1 Hour Tutorial = 1 Credit, 2 Hours Practical = 1 Credit, 2 Hours Internship/Project/Seminar = 1 Credit
- As per NCrF/NEP 2020, Minimum Self-Learning or Term Work Hours per Semester should be calculated in such a way that 1 Credit should have minimum 30 Hours of Teaching and Self Learning Engagement per semester