



(Shri Ramkrishna Seva Mandal's)
ANAND COMMERCE COLLEGE

An Autonomous College (2025-26 to 2034-35)
(Affiliated to Sardar Patel University)
NAAC ACCREDITED "A" GRADE (3.04 CGPA)
ISO 9001:2015



Syllabus as per NEP 2020 with effect from the Academic Year 2025-2026

Bachelor of Computer Applications
BCA Semester – II

Course Code	UCA02IDBCA05	Title of the Course	Digital Electronics
Total Credits of the Course	2	Hours per Week	2

Course Objectives	<ol style="list-style-type: none">1. To understand fundamental digital concepts including logic gates, Boolean algebra, binary arithmetic, and simplification using Karnaugh maps.2. To study the design and working of combinational and sequential circuits such as multiplexers, encoders, decoders, flip-flops, and counters.3. To explore storage elements like registers and apply digital components in real-time applications such as clocks and data processing systems.
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Course Content		
Unit	Description	Weightage* (%)
1.	Logic gates NOT, OR, AND, Universal NAND and NOR gates, EX-OR and EX-NOR gates, DeMorgan's Theorems, Universal building blocks (NOT, OR, AND) Binary addition and subtraction, 1's complement, 2's complement, Adders (half & full), Subtractor (half & full).	35% 11 Hr.
2.	Boolean Algebra Sum of products method, Product of methods, Truth table of Karnaugh map, Pairs, Quads and Octet, Karnaugh map simplification, Digital Logic families and their parameters. Multiplexer and Demultiplexers 4X1 Multiplexer, 8X1 Multiplexer, 16X1 Multiplexer, 1X4 Demultiplexer, 1X8 De-multiplexer, Decoder, BCD-to-decimal decoder, Encoder, Parity Checkers	35% 11 Hr.
3.	Flip-flops Types of flip-flops, RS (NAND and NOR) flip-flop, Edge triggered D flip-flop, Edge triggered T flip-flop, Edge triggered JK flip-flop, Master-	30% 08 Hr.

	Slave flip-flop, Triggering, propagation delay time, setup time, hold time. Counters Asynchronous (Ripple) Counters (Up and Down), Synchronous Counters (Up/Down and Mod-n), Design Using Flip-Flops, Timing Considerations, Applications (e.g., Digital Clocks, Frequency Dividers) Registers Concept of Data Storage, Shift Registers (SISO, SIPO, PISO, PIPO), Bidirectional Shift Registers, Applications of Shift Registers.	
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Teaching-Learning Methodology	In Order To Achieve The Course Objectives, Students Will Be Introduced To Digital Technologies. Various Digital Modules Used To Create Digital Computer Devices Like Gates, Flip Flops, Decoder, Encoder Etc
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Course Outcomes: Having Completed This Course, The Learner Will Be Able To	
CO1	To learn logic gates and perform binary arithmetic operations using adders and subtractors.
CO2	To learn Boolean simplification and use multiplexers, demultiplexers, decoders, and encoders in digital circuits.
CO3	To learn and understand the practical applications of digital systems.

Suggested References	
Sr.No.	References
1.	Digital Design – M. Morris Mano & Michael D. Ciletti
2.	Digital Principles and Applications – Donald P. Leach & Albert Paul Malvino
3..	Fundamentals of Digital Logic with VHDL Design – Stephen Brown & Zvonko Vranesic
Digital resources to be used if available as reference material	
Digital Resources	
https://www.tutorialspoint.com/digital_electronics/index.htm	
https://www.geeksforgeeks.org/digital-electronics-logic-design-tutorials/	

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