BC101 ---DIGITAL COMPUTER FUNDAMENTALS

Course Description and Objective: The student should learn the Fundamental components used in a Digital Computer which is essential for the programme.

Course Outcomes: After Completion of the subject student should able to

- Identify the logic gates and their functionality
- Perform Number Conversions from one System to another System
- Design basic electronic Circuits(combinational circuits)
- Understand the Construction of Memory

Unit 1: Introduction to Number System and Codes: Decimal Numbers, Binary Numbers, Decimal to binary Conversions, Binary Arithmetic, 1's and 2's complements of Binary Numbers, Signed Numbers, Arithmetic Operations with Signed numbers, Hexadecimal Numbers, Octal Numbers, Digital Codes, Error Detection Codes.

Unit 2: Logic gates and Boolean Algebra: The Inverter, The AND gate, The OR gate, The NAND gate, NOR gate, The Exclusive – OR gate and Exclusive NOR gate. Boolean Operations and Expressions, Laws and Rules, DeMorgan's Theorems, Boolean Expressions and Truth tables, The karnaugh Map, SOP minimizations.

Unit 3: Combinational Logic Analysis: Basic combinational Logic Circuits, Implementing Combinational Logic, The Universal Property of NAND and NOR Gates. Functions of Combinational Logic: Basic Adder, Parallel Binary Adders, Comparators, Decoders, Encoders, Code Converters, Multiplexers, Parity Generator/Checkers.

Unit 4: Latches and Flip-flops: Latches, Edge Triggered Flip-Flops, Flip-Flop Operating characteristics, Flip-Flop Applications. **Counters:** Asynchronous Counters, Synchronous counters.

Unit 5: Memory and Storage: Memory Basics, The RAM, The ROM, Programmable ROMs, The Flash Memory, Memory Expansion, Special Types of Memories, Magnetic and Optical Storage.

TEXT BOOK: 1. Floyd, Thomas L: "Digital Computer Fundamentals", 10th Edition, 1997. University Book Stall.

REFERENCE BOOKS: 1. Malvino, Paul Albert and Leach, Donald P: "Digital Principles and Applications" 4th Edition, 2000. TMH.
2. Malvino, Paul Albert and Leach, Donald P: "Digital Computer Fundamentals" 3rd Edition, 1995. TMH.
3. Bartee, Thomas C: "Digital Computer Fundamentals" 6th Edition, 1995. TMH.