## GENERAL AWARENESS COURSE III: 4A13CSC DIGITAL ELECTRONICS

| SEMESTER | COURSE CODE | HOURS PER WEEK | CREDIT | EXAM HRS |
|---|---|---|---|---|
| 4 | 4A13CSC | 3 | 3 | 3 |

## COURSE OUTCOME

**CO1:** Introduce the basic and important concepts of Digital Principles and Applications.
**CO2:** Familiarize with basic building blocks of Digital systems, Digital Logic and Digital Circuits.
**CO3:** Design simple combinational digital systems.
**CO4:** Familiarize different number systems, codes and data representation.

**Unit I:**

Digital Concepts: Digital and Analog Quantities – Binary Digits, Logic Levels and Digital Waveforms - Basic Logic – Number Systems: Decimal, Binary, Hexa-decimal and Octal – Conversions -CODES: BCD, ASCII, Excess-3, GRAY and UNICODE. BINARY ARITHMETIC: Addition, Compliments, Subtraction using Complements (r's and (r-1)'s).

**(10 Hrs)**

**Unit II:**

LOGIC GATES: Inverter-AND-OR-NAND-NOR-XOR-XNOR, BOOLEAN ALGEBRA AND LOGIC SIMPLIFICATION: Boolean operations and Expressions – Laws and Rules of Boolean Algebra – De-Morgan's Theorem – Boolean analysis of Logic Circuits – K-Map and Function Simplification using K Map– SOP and POS

**(15 Hrs)**

**Unit III:**

Combinational Circuits: Basics of Combinational Logic Circuits – Implementing Combinational Logic – Universal Property of NAND and NOR gates, Adders (Half, Full and Parallel) – Comparators – Decoders – Encoders – Multiplexers - Demultiplexers- Parity Generators-Parity Checkers.

**(15 Hrs)**

**Unit IV:**

Sequential Circuits:-Latches, Flip Flops – SR, JK Flip flops – Master Slave Flip flop. COUNTERS: Asynchronous counters - Synchronous counters- Shift Registers in Detail.

**(14 Hrs)**

**Books for Study:**

1. Digital Fundamentals, Floyd and Jain, 8th Edn, Pearson Education.
2. Computer system Architecture – M. Morris Mano - PHI Pvt Limited.

**Books for Reference:**

1. Digital Principles and Applications; Leach and Malvino, GoutamSaha; TMH; 7th edition (Special Indian Edition).

**Marks including choice:**

| Unit | Marks |
|---|---|
| I | 15 |
| II | 15 |
| III | 15 |
| IV | 15 |