

## **ELECTRONICS\_OE\_1.1 INTRODUCTORY DIGITAL CONCEPTS**

### **Unit I**

**05 Hours**

**Introduction :** Digital and Analog Quantities, Digital waveforms, Binary Digits, Logic Levels and Digital Waveforms. Basic Logic Functions. Combinational and Sequential Logic Functions. Introduction to Programmable Logic. Fixed-Function Logic Devices. Positive and negative logic. Pulse characteristics.

### **Unit II**

**10 Hours**

**Number Systems, Operations and Codes :** Decimal Numbers, Binary Numbers, Radix Representation of Numbers, Decimal to Binary Interconversion, Binary Arithmetic, Complements of Binary Numbers, Signed Numbers, Arithmetic Operations with signed Numbers, Octal Numbers, Hexadecimal Numbers. Codes: 8421, BCD, Excess-3, Gray, Alphanumeric, Bar code, QR code

### **Unit III**

**10Hours**

**Logic Gates :** The Inverter, The AND gate, The OR gate, The NAND gate, The NOR gate, The Exclusive-OR and Ex-NOR gate, Programmable Logic and Fixed-Function Logic gates. Logic families- mention only.

Boolean Algebra and Logic Simplification: Boolean Operations and Expressions, Laws and Rules of Boolean Algebra. De Morgan's Theorems. Boolean Analysis of Logic Circuits. Logic Simplification using Boolean Expressions.

### **Books Recommended:**

1. Digital fundamentals: T.L.Floyd , Universal Book Stall,8th edition,2005.
2. Modern digital electronics R.P Jain –TMH publication, 3rd edition, 2003.

### **Reference books:**

1. Fundamentals of digital circuits: A Anand Kumar, PHI, 3rd edition 2004
2. Experiments in Digital Electronics: Malvino and Leach – TMH, 2000
3. Digital Lab Primer- K A Krishnamurthy, Pearson education 2003

**Prerequisites:** *The course is open for students of all the streams. No special prerequisite is required for this course other than interest in learning Binary and other number systems, Boolean algebra and Logic Gates which form the basis of any Electronic circuit and is fun to learn. The course develops a hobby in Electronics.*