

Content developed in association with **EISystems Services**

## Content Outline

### **SESSION 1: Introduction to Basic Electronics**

- Basic Electronics Components
- Fundamental of Electronics Components
- Resistors
- Transistors
- Capacitors
- Diodes

### **SESSION 2: Introduction to Microcontrollers**

- What is microcontroller?
- Difference Between microcontroller & microprocessor?
- Introduction to Arduino & Atmega Microcontrollers
- Architecture of the Arduino UNO board
- How can we use an own microcontroller board in our project?
- Pin description of Arduino UNO R3

### **SESSION 3: Introduction to Arduino Programming**

- Installation of Software
- Introduction of major elements of Arduino compatible software
- Arduino Programming basics & hardware interfacing.
- Program structure and debugging
- Breadboards & applied circuitry
- First Program.

**Experiment 1: Simple LED Blinking Program.**

**Experiment 2: LED Pattern Showcasing Program.**

### **SESSION 4 # Working with Sensors – Part 1**

Infrared Sensors

- What is a Infrared Sensor?
- Working of Infrared Sensor
- Practical Demonstration of IR Sensor
- Code Optimisation

### **SESSION 5 # Working with Sensors – Part 2**

Ultrasonic Sensors

- What is a Ultrasonic Sensor?
- Working of Ultrasonic Sensor
- Practical Demonstration of IR Sensor

- Code Optimisation

**SESSION 6 # Display Devices**

Display Devices

- Working of Display Devices
- 16X2 LCD & its working
- Practical Demonstration of 16X2 LCD
- Code Optimisation & related experiments

**SESSION 7 # DTMF Technology Session**

- Talk about Railway IVRS System & its usage.
- DTMF Technology
- DTMF Encoders & Decoders
- Interfacing of DTMF ICs
- Practical Demonstration of DTMF Technology

**SESSION 8 # Electrical Systems Interfacing**

Electrical Systems Interfacing

- How Electrical-Electronics System works?
- Use of Relay Module
- Relay Module & its working
- Operating Electrical Bulb using input electronically.

**Number of Team Members: 4**