

Course Title: Basic Automation using Arduino

Module 1: Introduction to Automation & Arduino Basics

- What is automation?
- Manual vs automated systems
- Automation in daily life and industry
- Introduction to Arduino ecosystem
- Arduino UNO architecture
- Arduino IDE installation & setup

Hands-On

- First Arduino program (Blink LED)
- Understanding pins and power

Module 2: Programming Fundamentals for Automation

- Structure of Arduino programs
- Variables and data types
- Digital input and output
- Logics & Loops
- Timing functions

Hands-On

- Button-controlled LED
- Traffic light logic using LEDs

Module 3: Sensors & Data Acquisition

- Digital vs analog sensors
- Sensor working principles
- LDR (light sensor)
- IR sensor (object detection)
- Temperature sensors (LM35 / DHT)

Hands-On

- Automatic street light using LDR
- Object detection alarm using IR sensor

Module 4: Actuators & Control Systems

- Actuators in automation
- Buzzer, relay, DC motor (conceptual)
- Interfacing relays safely
- Threshold-based automation

Hands-On

- Temperature-controlled fan (relay demo)
- Alarm system with buzzer
- Time-based automation

Module 5: Integrated Automation Mini-Projects**Project Options (Team-Based)**

- Automatic street lighting system
- Smart water level indicator
- Smart room automation (light + alarm)
- Safety alert system