

Arduino

1. Introduction to Arduino
2. Getting Started with Arduino IDE
 - Download the Arduino IDE
 - Install the Arduino IDE software
 - Connecting Your Arduino Board
 - Writing Your First Sketch (Program)
 - Compile Code
 - Upload Code
 - Monitoring Serial Output
3. Serial Communication
 - Establishing serial communication between Arduino and a computer.
4. Basics of Arduino Programming
 - Structure of an Arduino program
 - Variables, data types, and operators.
 - Conditional statements and loops.
5. Input and Output
 - Interfacing LEDs: Blinking an LED.
 - Reading from digital and analog pins.
 - Controlling LED brightness using Pulse Width Modulation (PWM).
6. Arrays, Strings, Functions and Libraries
 - Arrays and strings in Arduino programming.
 - Functions and their implementation.
 - Working with libraries and creating your own functions.
7. Interfacing with Switches and Buttons
 - Understanding digital inputs and debouncing.
 - Implementing push-button switches and toggle switches.
8. LED Interfacing and Resistor Calculation
 - Understanding the importance of current-limiting resistors when using LEDs.
 - Calculating resistor values for safe LED operation with Arduino pins.
9. Interfacing with Displays
 - LCD
 - OLED
10. Sensor Integration:
 - DHT22 Temperature and Humidity Sensor
 - Servo Motor
 - HC-SR04 Ultrasonic Distance Sensor
 - Buzzer for Auditory Feedback
11. Data Logging and SD Cards
 - Logging sensor data to an SD card.
 - Storing and retrieving data for analysis.