Internet Of Things
Internship (4 weeks ,8 weeks ,12 weeks)

Anspro Technologies
Website:www.ansprotech.com

Basics of arduino

- What is Arduino? (microcontroller, open-source platform, uses ATmega chips)
- Arduino board types (UNO, Mega, Nano, etc.)
- Understanding Arduino IDE
- How Arduino code works (setup() and loop())

Basics of C Programming in Arduino

Syntax & Structure

- Variables & Data Types (`int`, `float`, `char`, `boolean`)
- Operators (arithmetic, logical, relational)
- Control Structures (`if`, `else`, `for`, `while`)
- Functions (creating and using your own functions)

Arduino-specific C

- `setup()` – runs once
- `loop()` – runs repeatedly
- `pinMode()`, `digitalWrite()`, `digitalRead()`
- `analogRead()`, `analogWrite()`

Working with Basic Electronics

- Understanding voltage, current, resistance
- Using breadboard, resistors, jumper wires
- Powering the Arduino (USB vs external)

Basic Sensors and Components

- **LED** – blinking, traffic lights
- **Button (Push Switch)** – digital input
- **Potentiometer** – analog input
- **LDR (Light Dependent Resistor)** – measure light intensity
- **Ultrasonic Sensor (HC-SR04)** – distance measurement
- **Temperature Sensor (LM35/DHT11)** – read temperature
- **IR Sensor** – obstacle detection
- **Servo Motor** – basic control
- **Buzzer** – sound output

ESP8266 Module (Wi-Fi + IoT with Arduino)

What is ESP8266?

- A **low-cost Wi-Fi microchip** with TCP/IP stack and microcontroller capability.
- Commonly used modules: **ESP-01, NodeMCU, Wemos D1 Mini**.
- Can be programmed via **Arduino IDE**.

ESP8266 Basics

- **Microcontroller** with built-in Wi-Fi.
- Works standalone or as a Wi-Fi module with Arduino.
- Supports TCP/IP, HTTP, MQTT protocols for IoT applications.

Programming ESP8266

1. Install **ESP8266 board manager** in Arduino IDE.
2. Select board: `NodeMCU 1.0 (ESP-12E)` or `ESP8266 Module`.
3. Use USB-to-Serial for ESP-01 or direct USB for NodeMCU.

Hands on project

Benefits:

- Offer Letter
- Report Content
- Certificate