

MICROPROJECT PHASE 2 REPORT

IoT Based Weather Monitoring System Using NodeMCU and ThingSpeak

Submitted by:

Anna Joseph (Roll No: 14)

Arsha Hanna Anvar (Roll No: 16)

Gayathri M S (Roll No: 26)

Department of Electronics and Communication Engineering
Saintgits College of Engineering

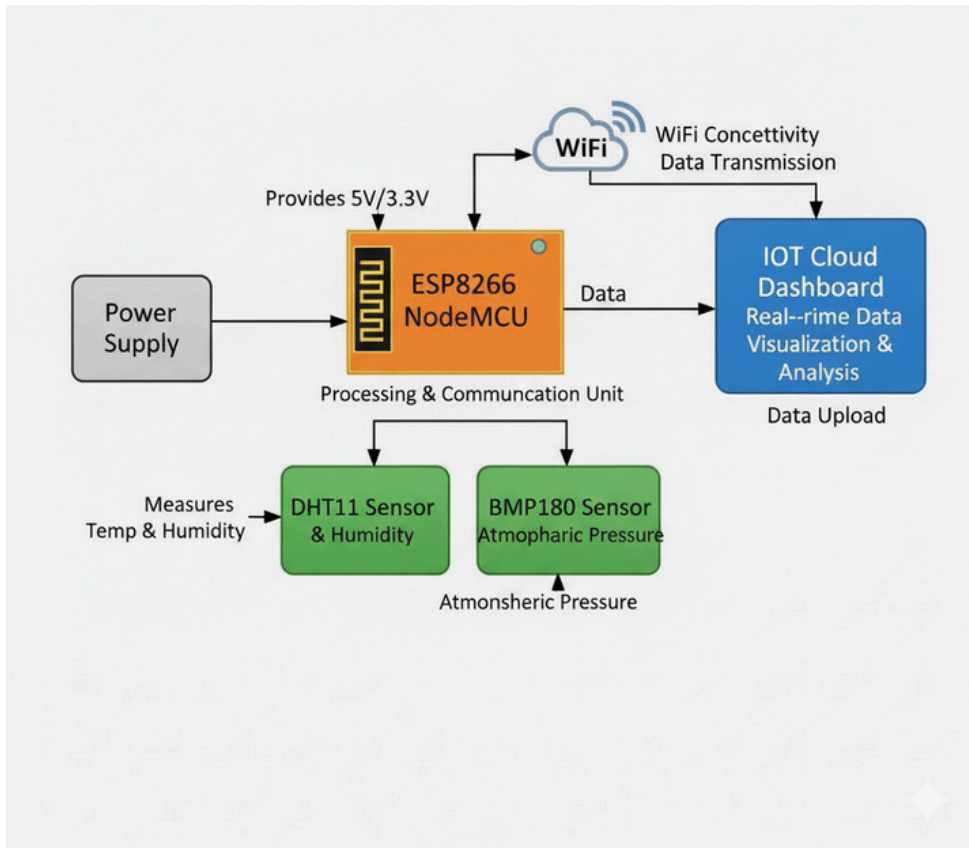
1. Introduction and Objectives

The project titled “IoT Based Weather Monitoring System using NodeMCU and ThingSpeak” aims to monitor environmental parameters such as temperature, humidity, and atmospheric pressure in real time. The system uses a NodeMCU ESP8266 microcontroller connected to sensors (DHT11 and BMP180) which measure these parameters and send the data to the ThingSpeak cloud platform through Wi-Fi.

Objectives:

- To design a low-cost IoT-based weather monitoring system.
- To collect and transmit temperature, humidity, and pressure data in real time.
- To visualize the data on the ThingSpeak cloud using live graphs.
- To demonstrate the use of IoT in environmental monitoring.

2. Functional Block Diagram and Explanation

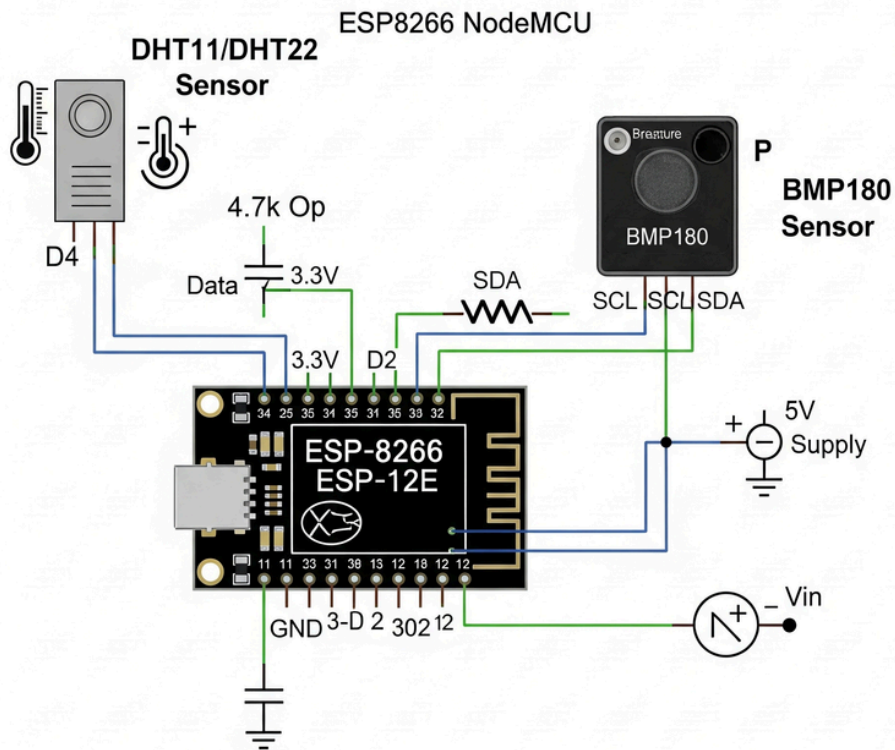


Functional Block Diagram of IoT-Based Weather Monitoring System

Explanation: The system consists of:

- Sensors: DHT11 measures temperature and humidity, BMP180 measures atmospheric pressure.
- Controller: NodeMCU (ESP8266) reads sensor data and sends it via Wi-Fi.
- Wi-Fi Module: Provides internet connectivity.
- Cloud Platform (ThingSpeak): Stores and visualizes the sensor data.
- User Interface: Displays real-time graphs of temperature, humidity, and pressure.

3. Circuit Diagram, Components and Working Principle



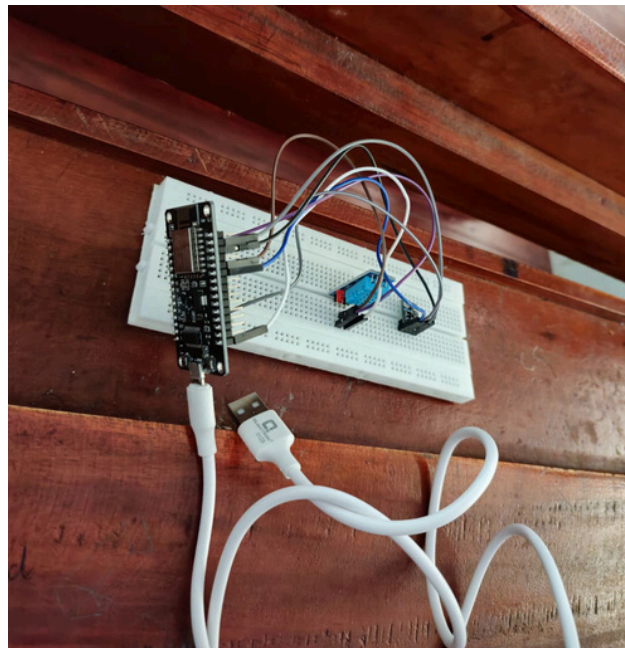
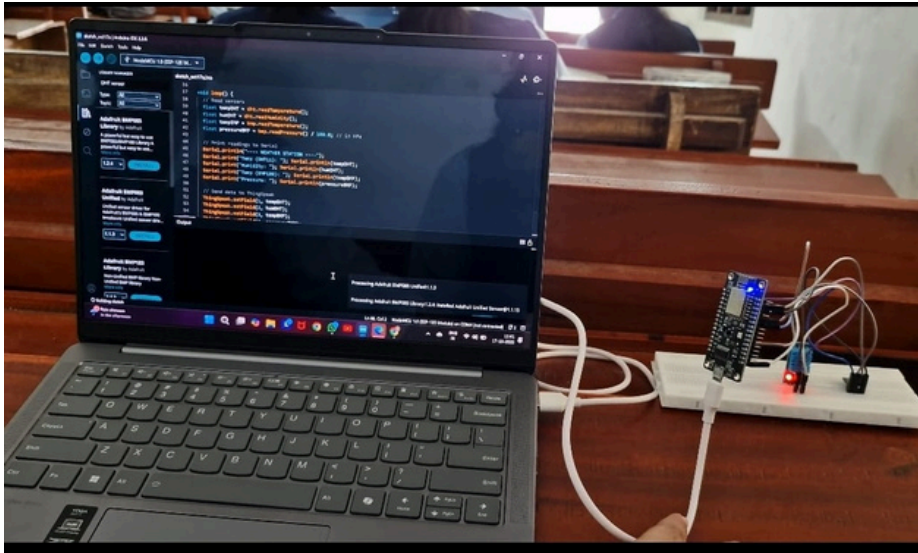
Circuit Diagram of the Weather Monitoring System

Connections:

- DHT11 → Data pin to D4 (GPIO2)
- BMP180 → SDA to D2, SCL to D1 (I2C Communication)
- Both sensors powered using 3.3V and GND

Working Principle: Sensors measure temperature, humidity, and pressure. NodeMCU processes these values and uploads them to the ThingSpeak server via Wi-Fi. The server then visualizes the readings as live plots accessible online.

5. Image of Working Model



Working Model of IoT-Based Weather Monitoring System

6. Expected and Observed Results

Expected:

- Successful data transmission to ThingSpeak.
- Continuous live monitoring on the dashboard.

Observed:

- Accurate temperature, humidity, and pressure readings.
- Smooth upload of data every 20 seconds.
- Clear ThingSpeak graphs confirming real-time updates.

Conclusion: The project successfully demonstrates real-time weather monitoring and IoT-based data visualization.