Internet of Things with Robotics

1.Introduction to Arduino and IoT:

- Overview of Arduino boards and their capabilities.
- Understanding the basics of IoT and its applications.

2.Getting Started with Arduino:

- Setting up the Arduino IDE.
- Writing and uploading a simple Arduino sketch.
- Introduction to Arduino programming (C/C++).

3.IoT Fundamentals:

- Exploring IoT concepts and its significance.
- Overview of communication protocols (MQTT, HTTP, etc.).

4.Arduino and Sensors:

- Connecting & interfacing various sensors (temperature, humidity,motion)
- Reading sensor data and displaying it.

5.IoT Communication:

- Using Wi-Fi and Ethernet modules with Arduino.
- Implementing MQTT for communication between devices.

6.Cloud Platforms:

- Integrating Arduino with popular IoT platforms (e.g.,Blynk)
- Uploading sensor data to the cloud.

7.IoT Security:

- Basics of IoT security.
- Implementing secure communication and data handling.

8.Arduino and Actuators:

- Controlling actuators (LEDs, motors, etc.) based on sensor data.
- Building simple IoT applications.

9.Project Development:

- Guided projects combining various IoT concepts.
- Students develop their IoT projects with support.

10.Troubleshooting and Optimisation:

- Debugging common issues in IoT projects.
- Optimising code for better performance.

11.Final Project:

- Students design and implement a comprehensive IoT project.
- Presentation and evaluation of final projects.

8 Weeks Training Shedule

Week 1

Day 1 (2hrs)

* Introduction to basic electronics and electrical circuits(AC and DC).
* Introduction to Arduino with IOT.
* Introduction to Digital and Analog Data.
* Explaining Binary language (0 and 1) .

Day 2 (2hrs)

* Introduction to BreadBoard .
* Explaining basic LED circuits and Interfacing with bread board.
* Interfacing Electronics components with BreadBoard.

Day 3 (2hrs)

* Introduction to Transistor .
* solving some problems using Transistor.

Day 4 (2hrs)

* Introduction to OPTOCOUPLER .
* solving some problems using OPTOCOUPLER IC.

Day 5 (2hrs)

* Introduction to Resistor .
* Creating circuit using Resistor .

Week 2

Day 1 (2hrs)

* Introduction to Relay.

* solving some problems using Relay.

Day 2 (2hrs)

* Introduction to Arduino UNO .

* Explaining Simple program using C in Arduino IDE.

Day 3 (2hrs)

* Explaining “digital write “ command used in Arduino .

* Creating simple program using “Write” command.

Day 4 (2hrs)

* Explaining “Serial Communication “ used in Arduino .

* Creating simple program using “Serial monitor ” command.

Day 5 (2hrs)

* Explaining “digital read “ getting data from sensor and to print sensor data in serial monitor .

* Creating simple program using “Read and Print ” command.

Week 3

Day 1 (2hrs)

* Explaining “Node MCU Board “ .

* types of node MCU .

Day 2 (2hrs)

* Explaining “ESP8266 Board “ .

* Creating basic operation using ESP8266.

Day 3 (2hrs)

* Explaining “ESP32 Board “ .

* Creating basic operation using ESP32.

Day 4 (2hrs)

* Explaining “Arduino NANO Board “ .

* Creating basic operation using Nano board

Day 5 (2hrs)

* Explaining “ESP32 Camera Board “ .

* Creating basic operation using ESP32CAM board

Week 4

Day 1 (2hrs)

* Explaining “ESP-01 board “ .

* Creating basic operation using ESP-01 board.

Day 2 (2hrs)

* Explaining “IF and ELSE IF “ command used in Arduino .

* Creating simple program using “if statement” command.

Day 3 (2hrs)

* Explaining “for loop “ command used in Arduino .

* Creating simple program using “for” command.

Day 4 (2hrs)

* Explaining “WHILE “ command used in Arduino .

* Creating simple program using “WHILE” command.

Day 5 (2hrs)

* Explaining simple project using sensors data and if statements.

* Printing the output in serial monitor.

Week 5

Day 1 (2hrs)

* Explaining simple project Liquid Crystal Display.

* Printing simple details in LCD Display.

* Explaining how to Interfacing Analog and Digital sensor's Output in LCD Display

* Creating Simple project using LCD Display

Day 2 (2hrs)

* Explaining simple project using MQ Sensor.

* Creating simple project using MQ sensor.

* Creating MQ02 based Fire Alarm.

Day 3 (2hrs)

* Explaining functions of IR Proximity Sensor.

* creating simple project using IR Proximity Sensor.

Day 4 (2hrs)

* Explaining functions of DHT Sensor.

* creating simple project using DHT 11 and DHT 22 Sensor.

Day 5 (2hrs)

* Explaining functions of Microphone Sensor.

* creating simple project using Microphone Sensor.

Week 6

Day 1 (2hrs)

* Explaining functions of Ultrasonic Sensor.
* creating simple project using Ultrasonic Sensor.

Day 2 (2hrs)

* Explaining functions of PIR Sensor.
* creating simple project using PIR Sensor.

Day 3 (2hrs)

* Explaining functions of LDR Sensor.
* creating simple project using LDR Sensor.

Day 4 (2hrs)

* Explaining functions of Soil moisture Sensor.
* creating simple project using Soil. Moisture Sensor.

Day 5 (2hrs)

* Explaining How to solve Big Problems using multiple digital and analog sensor.
* creating simple project combining multiple sensors.

Week 7

Day 1 (2hrs)

* Explaining functions of HC05 and HM10 Bluetooth Module.
* Creating simple project using HC05 Module.
* Controlling Devices using Bluetooth wirelessly using mobile
* Controlling Devices using Bluetooth wirelessly using Computer

Day 2 (2hrs)

* Controlling devices over voice command from mobile phones .
* Creating a Project to launch a rocket via Voice Command .

Day 3 (2hrs)

* Creating a wireless notice board using LCD display
  And Bluetooth Module .

Day 4 (2hrs)

* Explaining what is Universal Telegram bot .
* Creating a Telegram bot and connecting Telegram API with
  Microcontroller.

Day 5 (2hrs)

* Explaining to send and receive data from Telegram
* Control devices by sending Telegram Messages

Weak 8

Day 1 (2hrs)

* Explaining BLYNK Server .

* Creating Projects using Blynk Platform .

Day 2 (2hrs)

* Introduction to R307 Fingerprint Sensor.

* Enrolling and validating Fingerprints using R307 Sensor.

*Creating Secutity Based projects using Fingerprint sensor.

Day 3 (2hrs)

*Introduction to RFID and NFC sensor.

* Creating basic project to Read and Write RFID sensors.

* Creating Security based project using RFID and NFC.

Day 4 and 5 (Full Day class)

*Creating Final Project