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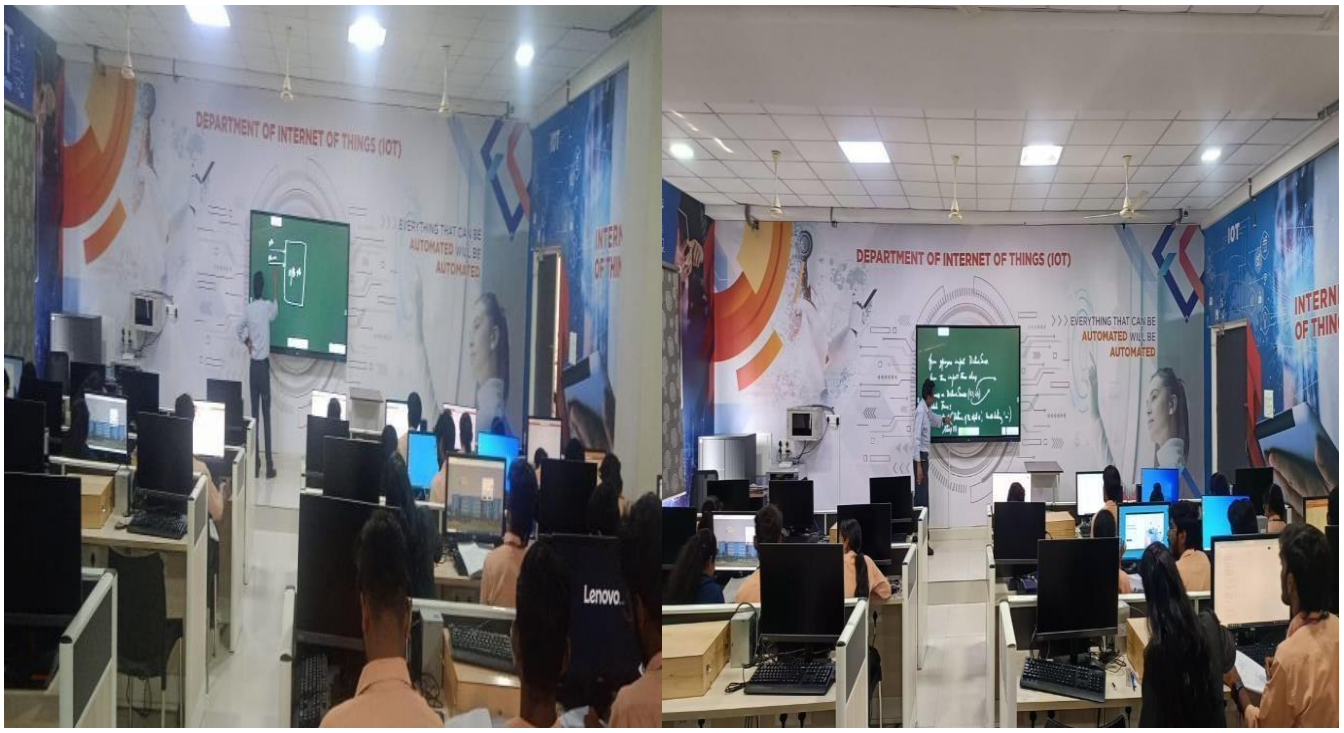
DEPARTMENT OF INTERNET OF THINGS

PROGRAMMING LANGUAGES FOR IoT LAB

OBJECTIVE: The objective of PROGRAMMING LANGUAGES FOR IoT LAB to equip students with practical experience in various IoT architectures, focusing on the integration of sensors and actuators. It emphasizes the development of skills in data collection and cloud logging, while also exploring the underlying technologies that facilitate IoT solutions. Additionally, students will learn to utilize the Arduino Integrated Development Environment for coding, compiling, and uploading programs to microcontrollers, thereby enhancing their technical proficiency in IoT applications.

PHOTOS:



LAB OUTCOMES:

1. Understand Arduino, ESP8266 and Raspberry Pi along with critical protocols and its communication to cloud.
2. Understand to apply commonly used IoT protocols such as MQTT through IoT based demonstration.
3. Solve analog sensor and digital sensor interfacing with IoT devices
4. Explore different interfaces available on Raspberry Pi.
5. Develop programming skills in Python for Raspberry Pi.

Lab Infrastructure

Room Capacity: Adequate for handling practical sessions for IoT applications.
Purpose: Provides a comprehensive environment for hands-on learning and experimentation with IoT devices, sensors, and cloud platforms.

Equipment Details

S.No	Equipment Name	Count	Description
1	Computers	48	Processor:Intel i5 12th gen 12400 2.50Ghz Installed RAM: 16gb DDR4 3200MHZ SSD :- 256 GB x-64 based PC System 64-bit operating system Operating Systems: Windows 10
2	Smart Digital Board	1	Smart Board with Internet Connection Audio System with cordless mic

3	Universal IOT Trainer Kits	24	Universal IOT Trainer kit has • Arduino Mega, • ESP8266 & Raspberry Pi Various on-board Sensors • DHT11 • PIR • Ultrasonic sensor, • Hall effect • LDR • sound sensor • IR sensor • Switches • Gas Sensors etc Various onboard Actuators • LEDs • Servo Motor • Relay modules • LCD etc On Board Peripherals

Software/Cloud Platforms

S.No	Name	Description
1	Arduino IDE	Used to develop IoT applications for Arduino-compatible boards.
2	Python IDLE	Programming platform for developing IoT applications using Raspberry Pi.
3	Arduino IoT Cloud, ThingSpeak, Blink Cloud, Node-RED	Open-source cloud platforms for data storage, analysis, and action.
4	Local Area Network (LAN)	Ethernet and Wi-Fi routers for seamless device communication and internet access.

This infrastructure is equipped to support a wide range of IoT experiments, fostering a practical understanding of hardware, software, and cloud integration for real-world IoT applications.

COORDINATORS:

The lab is coordinated by a dedicated team of faculty members who ensure the smooth conduct of lab sessions:

- **Dr. A.S.N. Murthy**
- **Mrs. B. Swetha**