Specialised Programme on IoT(Internet of Things) – 2 Weeks

Pre-requisites for the course

- Basic knowledge of C programming

Aim

- This course aims to develop knowledge and critical understanding of the underlying principles of Internet of Things

Objectives

- Understand the architecture of IoT.
- Familiarize on interfacing peripherals with Raspberry Pi to explore the application areas of IoT.
- To understand the building blocks of IoT and characteristics

Course Contents

Introduction to IoT, Understanding IoT fundamentals, IoT Architecture and protocols, Various Platforms for IoT, Characteristics of IoT, Current market trends in IoT.

Real time Examples of IoT, IoT Communication Technologies, Challenges in IoT.

Getting started with Raspberry Pi: Introducing the R Pi, R Pi Desktop vs Headless, Applications of R Pi, Different R Pi Boards, Exploring the R Pi board and its features, Installing the OS, R Pi GPIO Pinouts.

Booting Up RPi- Operating System, Raspbian O.S.- Introduction, Installing Raspbian on Pi, first boot and Basic Configuration of Pi, LED Blinking with Raspberry Pi using GPIO commands, LED control with Button using GPIO commands.

Interfacing Components: LED, Push button, LCD, Sensors & Actuators, Application of Sensors - Temperature - Vibration - Humidity, Ultrasonic sensor, Gas detection sensor, Examples for sensor, actuator, control circuits with sensors.

Connecting sensors and actuators to Raspberry Pi GPIO pins; Collecting and processing sensor data; Controlling actuators using Raspberry Pi; Developing IoT applications using sensors and actuators.

Overview of IoT Protocols, Current trends in IoT Protocols, Applications of IoT Protocols.

IoT Communication Protocols and Cloud Platforms; Introduction to IoT communication protocols using MQTT.

R Pi GPIO Programming: Understanding pin numbering schemes; Controlling LCD and other components using GPIO.

Introduction to cloud platforms; Setting up cloud platforms for IoT applications.

Introduction to IEEE 802.11, Introduction to Bluetooth Communication, Introduction to RFID.