



### **Report on One Day Hands on Training Program on IoT Fundamentals**

Event Type	:	Guest Lecture
Date / Duration	:	26.06.2025
Name of Coordinator(s):		Dr.G.L.N.Murthy
Name of the resource Person:		Dr.P.Lachi Reddy
Target Audience	:	Teaching and Non-Teaching Faculty
Total no of Participants:		23 Nos.
Objective of the event:		To educate the staff members about the developments in IoT and to provide practical exposure on embedded applications.
Outcome of event	:	By attending the hands-on training, the staff members can be able to get acquainted with the current trends and handle regular lab sessions on IoT irrespective of field of expertise.

### **Description / Report on Event:**

The session has begun by introducing the need of the program by Dr.G.Srinivasulu. It was mentioned that irrespective of domain of expertise each faculty must be aware of the trending technologies. Further, it was told that all faculty should be capable of handling any laboratory. It was told that whenever specific faculty is not available the lab sessions should not be affected. The Internet of Things (IoT) is a network of interconnected devices that collect, exchange, and process data via the internet without human intervention. These devices—ranging from sensors and appliances to industrial machines—use embedded systems, connectivity (Wi-Fi, Bluetooth, LoRa, 5G), and cloud platforms to monitor, control, and automate processes. IoT enables real-time insights, improves efficiency, and supports smarter decision-making in areas like healthcare, agriculture, transportation, manufacturing, and smart homes. By integrating physical objects with digital intelligence, IoT bridges the physical-digital gap, creating responsive, data-driven environments for enhanced productivity and convenience. It was mentioned that IoT (Internet of Things) fundamentals is crucial for gaining practical experience and building a deep understanding of how IoT systems operate.

Later, Dr. P. Lachi Reddy has given a deep insight into the need for IoT and its role in the current evolving world. Initially the audience were explained about Tinkercad, a simulating platform for IoT. Tinkercad is a free, web-based design and simulation tool developed by Autodesk, widely used for 3D modeling, electronics simulation, and coding. It offers an intuitive, drag-and-drop interface, making it accessible for beginners, students, and hobbyists. In electronics mode, users can design and simulate Arduino-based projects, test circuits, and visualize sensor-actuator interactions without physical components. In 3D design mode, Tinkercad enables the creation of models for 3D printing or prototyping. It supports block-based and text-based coding for microcontrollers, encouraging interactive learning. With its cloud-based nature, Tinkercad allows easy project sharing and collaboration, making it a popular choice for STEM education and IoT prototyping. The Internet of Things (IoT) works by connecting physical devices—such as sensors, appliances, and machines—to the internet, enabling them to collect, exchange, and act on data. First, sensors gather information (e.g., temperature, motion, location) from the environment. This data is then transmitted via communication protocols like Wi-Fi, Bluetooth, Zigbee, or 5G to a gateway or cloud platform. In the cloud, the data is processed, analyzed, and stored. Based on this analysis, IoT systems send commands back to devices to trigger actions or alerts. This real-time feedback loop enables automation, monitoring, and smarter decision-making in various applications. The Internet of Things (IoT) is a system of interconnected physical devices that collect, share, and exchange data over the internet without requiring human intervention. These devices range from everyday objects like household appliances and wearable gadgets to complex industrial systems and smart city infrastructures.

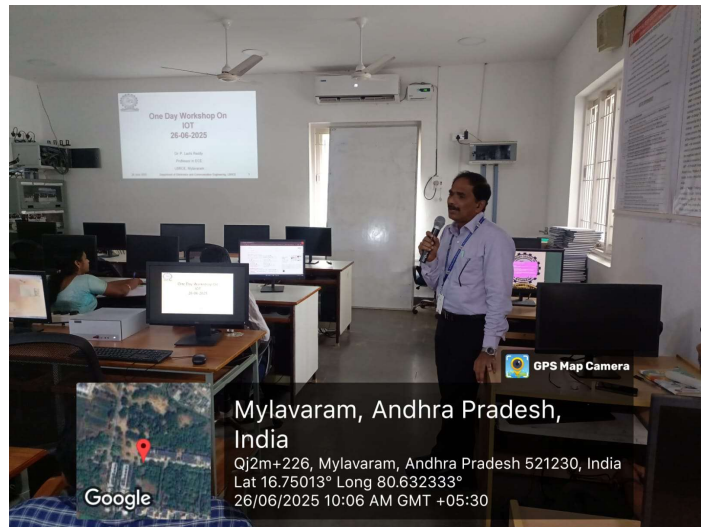
Working with Arduino involves using an open-source electronics platform based on easy-to-use hardware and software to create interactive projects. An Arduino board, such as Uno, Nano, or Mega, serves as the main microcontroller that reads inputs from sensors (e.g., temperature, light, motion) and controls outputs like LEDs, motors, or displays. Programming is done using the Arduino IDE, where code (sketches) is written in a C/C++-based language and uploaded via USB. The platform supports both digital and analog inputs/outputs, enabling diverse applications. Arduino's simplicity, vast library support, and active community make it ideal for education, hobby projects, and rapid prototyping. Real-time interaction between hardware and software allows users to bring creative ideas into functional, automated systems efficiently.

Later, the presented members were demonstrated few basic examples using both Tinkercad and Arduino and practiced the same

## Photos:



Dr.G.Srinivasulu giving rationale behind the workshop



Dr.P.Lachi Reddy introducing the IoT basics  
Supporting staff getting overview of Tinkercad working environment



Faculty members practicing IoT using tinkercad

Head of the Department